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DEMIS. AN INFORMATION SYSTEM TO SUPPORT EDUCATIONAL
MANAGEMENT AND COUNSELLING ACTIVITIES.

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⑨ Research rept.

⑪ Jun 76

⑩ by
Roger W. Sifrit

⑫ 138 p.

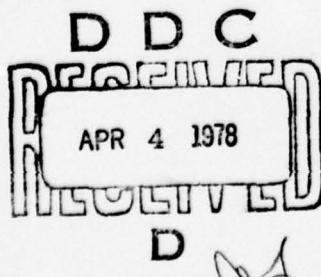
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submitted in partial fulfillment
of the requirements for the degree of
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Florida Technological University

June, 1976



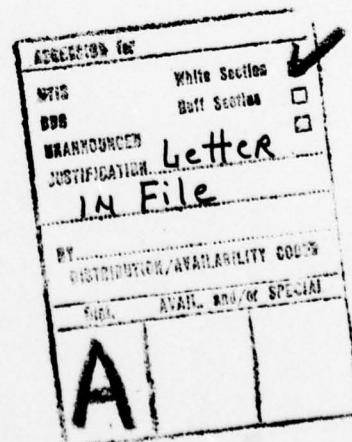
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PREFACE

The value of Computerized Management Information Systems (MIS) was first realized in the 1960's. Since that time numerous approaches have been developed to implement MIS. Some have failed, others have been developed as a backlash to these failures. This report traces, briefly, the history of computerized Management Information Systems, then proposes an approach for the development of a small MIS. This approach was evaluated through the development of the Department of Mathematical Sciences Information System (DEMIS) and its first operational Module, the Student Information System (SIS). The report is divided into five chapters. Chapter 1 traces the history of MIS and outlines the approach proposed for small system development. Chapter 2 discusses general information pertaining to SIS. Chapter 3 sets forth a complete yet simple set of operator instructions. Chapter 4 provides philosophy, approaches and requirements for system maintenance and modification, and Chapter 5 looks at the future of DEMIS and provides some concluding remarks.

Following the text is complete documentation on the system including the design package, a system listing, sample outputs, input card formats, configuration of maintenance and execution decks, a list of error messages with explanations and required corrective actions, and listings of file creation

and SIS cataloging decks.

I gratefully acknowledge the assistance provided by the personnel of the FTU Computer Center whose help made completion of this project possible. I am especially indebted to William H. Branch, Thomas O. Peeples, James Radford, and Bernard L. Slessinger.

Chapter 1

MANAGEMENT INFORMATION SYSTEMS: THEIR HISTORY AND A PROPOSED DEVELOPMENTAL APPROACH

The use of the computer as a management tool is traceable back to the mid 1950's (Mathews, 8). It was first used to reduce clerical work, with applications expanding into payroll, personnel, inventory status, cost distribution, sales analysis and similar applications. The 1960's brought about a new role for the computer, that of providing information which could help in management decision making. In this regard, however, the numerous stand-alone applications which had been developed presented a problem. Each had its own data base which duplicated information found in the other data bases. Not only was this wasteful in terms of duplicate storage of data, but data consistency problems were noted when like data items from several different data bases were examined. While inconsistencies were frequently explainable (e.g. one data base was updated daily, while another might require only monthly updating) questions nevertheless arose as to why data was maintained in more than one location. The solution to these problems was seen as developing separate but integrated data bases which would solve problems of inconsistency and duplication of data, and provide a means of integrating data for use in management oriented information

systems (MIS). The MIS required the variety of information which was then available. The software overhead required in the maintenance of integrated data bases soon led to the contemporary concepts of data base management systems which provide common data bases for a variety of applications. In the mid 1960's several factors combined to cause a tremendous increase in interest in Management Information Systems. These include the availability of integrated data bases, and the third generation computers with their increased speed and power. Management began to accept the computer and realized it's potential to provide information upon which management decisions could be made.

Unfortunately the late 1960's brought an era of unhappy experiences with MIS, many due to the "total" information concept which was not far enough along in its development to be placed into production. This concept also tended to drive an organization's information system rather than to augment and support existing (though perhaps non-automated) systems (Caruth 3:197)(the total concept is further discussed below). Management expected too much, too soon from their MIS, and the results were generally disappointing. The reaction to this experience was reevaluation of MIS theory and a tremendous proliferation of ideas in the literature.

Sherman C. Blumenthal (1) has written a classic text which classifies MIS approaches into six catagories:

1. The organizational approach establishes independent systems along organizational lines, with interaction depending on higher level coordination.
2. The data collection approach is to collect, classify and store data for some unknown future use.
3. The top down approach holds that once the information needs of top management are determined, the system necessary to supply the information can also be determined.
4. The data bank approach sets up a pool of highly detailed, unclassified data for some undetermined future use.
5. The integrated later approach is, as the name implies, a non-plan, a philosophy of continuing to develop more independent applications and "integrate them later".
6. The integrate now (or "total systems") approach, provides an "instant MIS", integrating all ADP functions at once. This is the approach which led to the reevaluation of MIS in the late 1960's.

Blumenthal then presents his own philosophy, with which I am in general agreement. He supports a "bottom up" approach combined with a systems plan. The plan can be considered from two aspects; global, which is a "plan of projects" or a framework for classifying and integrating modules, and

local, which consists of project plans or modules. Using this format, the modules are developed based on priorities, specifications, and integration considerations established by the "framework". Modules are developed to support operating level management. Their "communication" with the data bases of other modules is assured by the specifications developed in the framework. Selected data produced by the modules is copied into other data bases for use by higher level management based on Blumenthal's concept that the information required by higher level management is a subset of that produced by the lower level modules.

Blumenthal also describes the formal activities which should be accomplished in developing a system. These include:

Proposal study,

Problem definition, priority, and budget consideration,

Formal written proposal,

Initial user system organization assessment,

Preparation of a feasibility study,

Presentation of the feasibility study to management,

Assignment of project responsibility, allocation of resources, delegation of a steering committee,

Project planning and control,

Development of functional requirements,

Designing of system specifications,

Programming and testing, and

Conversion and cutover.

The only exceptions to this formal procedure are those applications which are obvious minor development efforts such as "special one-time reports". Most organizations with a major data processing investment utilize the concept proposed by Blumenthal to some extent. Unfortunately, once formal procedures are established for development of a system, generally no system, no matter how small, can be developed without going through the established formal organizational procedures.

The preimplementation criteria are, in themselves, costly enough to eliminate all but major systems from consideration.

The result of this environment is that the required strong economic justification for the small application is impossible, and so small applications tend to either be dropped or to mushroom into large systems, resulting in major contracts and extended periods of time for implementation.

The purpose of this paper is to provide an alternative approach using Blumenthal's "Bottom Up" Theory, but based on the thesis that formal procedures are not always necessary (may be accomplished informally); that requirements do not have to be large enough to justify major investments of time and resources; and that an organization's information requirements can evolve in an open ended plan, based on existing information resources.

This project considers the management information re-

quirements for one department of a college located at a large university. The information requirements were very real, yet probably not economically justifiable as a large project. Previous attempts to design information systems for other colleges in the university had either failed or their planning had dragged on over an extended period of time without realization of an operational system. The length of time to implement the system, the inability to support or maintain it, or the lack of a systemic approach to building a system to meet all information requirements resulted in a general loss of interest and the failure of these systems to produce satisfactory results.

The system described by this project was developed with a different approach, which is characterized by informal, though systematic, development, and includes a generalized MIS framework, which is flexible and open ended, and the first module of the system. The scenario for this approach was:

1. The users were contacted to determine what immediate information requirements existed, and the general nature of possible future additions to the system.
2. Personnel of the computer center were contacted to determine the type of information that was available in existing data bases to support a system such as the users felt they needed.

3. The users were again contacted and their requirements reappraised to make the maximum use of available data, and then the minimum additional data requirements were agreed upon.
4. A major system was conceptionalized which could contain a number of interrelated sub-systems.
5. The subsystem to support the immediate requirements was designed, coded, and implemented.

The system uses top down, structured, modular design and programming for ease of maintenance, and was designed so that it can be run using existing equipment and personnel resources.

User interest and enthusiasm in the project has been maintained at high level. This is attributable to several factors. The information supplied to the users was information they needed and in the required format. The time for development of the system was less than six months, during which the users received frequent, informal feedback on the status of the project. No elaborate justification for the project was required of the users, and rather than enlarging their requirements to justify the project, they were able to reduce requirements to the essential data that was needed. The result of the latter was that the system was able to operate using existing personnel and equipment resources which meant that the users did not have to divert

funds from other projects to pay for this system.

I feel that this concept of ADP support offers a responsive alternative to organizations which have MIS formal planning and design criteria, and where:

- a) the information requirements are valid,
- b) the information requirements are such that a large expenditure of time and money is not immediately justifiable, and
- c) most of the required information is already available in existing data bases.

Chapter 2

SYSTEM IMPLEMENTATION

GENERAL INFORMATION ON DEMIS / SIS

In keeping with the approach described in Chapter 1, a flexible, open ended framework was developed for the Department of Mathematical Sciences Information System (DEMIS). This framework is graphically illustrated in figure 1. No detailed specifications were made for the proposed modules of DEMIS, as this would detract from the flexibility of the system. Generalized contents of the modules are, however, discussed in concept in Chapter 5.

The Student Information System (SIS) is the first module of DEMIS to be implemented, and is designed to provide information to support management and counselling activities of the Department. SIS has been constructed using contemporary concepts of modular, top down, structured design, and structured programming techniques. It has also been designed to require minimum operator time, training, and skill, as well as minimum maintenance.

SIS provides useful, required, up to date information for the Department of Mathematical Sciences. It establishes a flexible, expandable student data base and a student enrollment statistical data base to be used by DEMIS. It also provides an interface for receiving data elements from the FTU

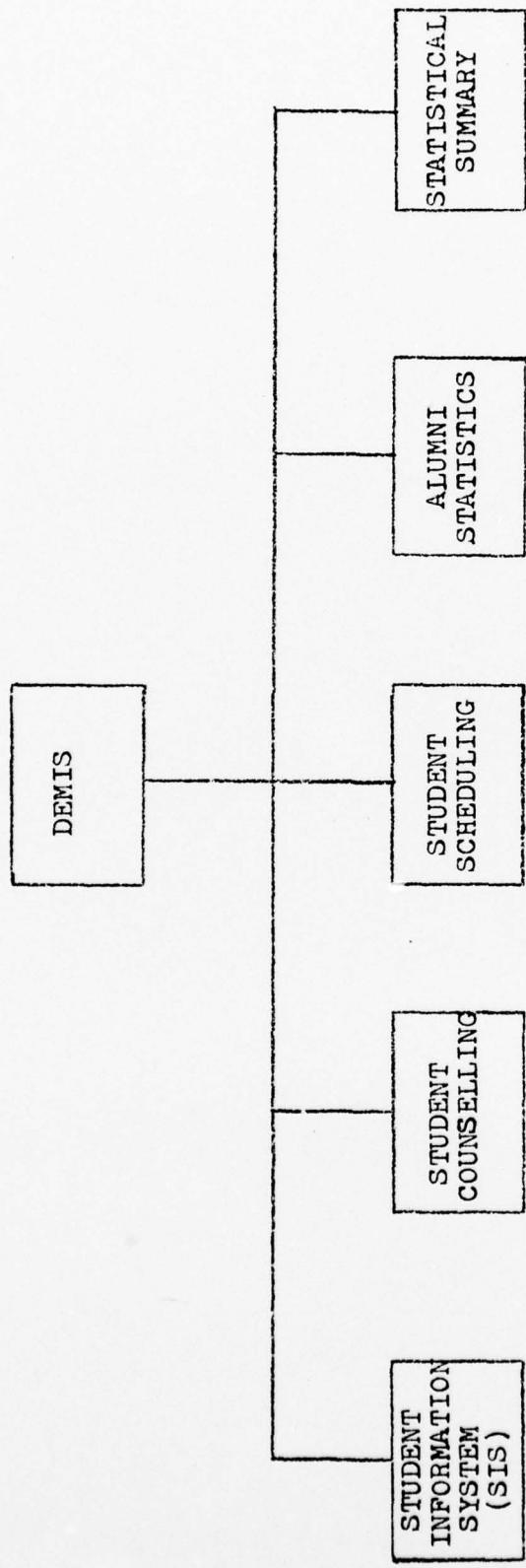


FIGURE 1
DEMIS FRAMEWORK

Student Record Data Base.

SIS BACKGROUND

With the continuing growth of student enrollment in the Department of Mathematical Sciences, it has become more and more apparent that certain required administrative information pertaining to student enrollment is not readily available, or, at least, not available in the required format. As a result, frequent time consuming searches through file cabinets containing student records, or through the numerous available computer printouts, is necessary to assemble the required data. Some of the more pressing information requirements are determining the number of students majoring in the various programs offered by the Department of Mathematical Sciences; determining the number and names of students who are in Post Baccalaureate Status so their progress toward achieving provisional or regular status may be periodically reviewed; providing faculty advisors with immediate background data on students whom they advise as well as data concerning their overall progress. Often, various faculty advisor listings must also be manually modified and up dated.

These problems indicated a need for an information system within the Department. DEMIS was developed to supply this information.

SYSTEM SPECIFICATIONS FOR SIS

In order to meet the requirements stated above, the following specifications were developed of SIS (the first module of DEMIS).

1. Outputs of the system will include:
 - A. A roster of students currently enrolled ordered by major, level of study (undergraduate, post baccalaureate, or graduate) and alphabetical by name (figure 2).
 - B. A roster of students ordered by faculty advisor (figure 3).
 - C. Listing of student-faculty advisor assignments (figure 4).
 - D. Listing of the students advised by each faculty member (figure 5).
 - E. A statistical printout which shows student enrollment at quarter intervals (figure 6).
2. The system should be designed so that it can be operated by clerical personnel in the department.
3. Complete documentation is required for maintenance and modification and to facilitate the addition of other modules to DEMIS.
4. Data maintained in a Mathematics Department Data Base should be minimal, with the greatest portion

**DEPARTMENT OF MATHEMATICAL SCIENCES
GRADUATE COMPUTER SCIENCE MAJORS**

MAY 26 1976

RAXTER	ADDRESS: JOHN HENRY	777 77 7777 G-COMP 7CF/3.88 ADVISOR: DR C L SMITH	SFX: M	MARITAL ST:M GR:N
	PARENT:	MEMR: ACM-9WCTU		
QTRS ATTENDED:	FTU/STATUS:			
ROSEN	SAMUEL	RRR K _P RRRR 6-704P 70F/3.95 ADVISOR: DR C L SMITH		
ADDRESS: QFN 999	DAPENT: RFD 999	FL 32456 LOCAL TEL: 395 666 8745 MEMRH: MMC	SFX: M	MARITAL ST:M GR:N
QTRS ATTENDED:	FTU/STATUS:	FL 32456		
	ORLANDO	ORLANDO		

DEPARTMENT OF MATHEMATICAL SCIENCES
FACULTY ADVISOR EXTRACT OF STUDENT ROSTER
MAY 26 1976

RAXTER	JIMMY QUIN	RUS STOP 177 RR 9999 P-COMP 705/3•985 ADVISOR: DR A C BROWN	SFX: M MARITAL ST:S GR:N
ADDRESS:	REIN 14 PARENT ROAD	CHICAGO	OTRS ATTENDED FTU/STATUS:
PARENT:	14 PARENT ROAD	FL 22233 LOCAL TEL: 305 666 9874 MEMBER:	
OTRS	ATTENDED FTU/STATUS:	TL 32564	
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ADDRESS:		LOCAL TEL:	MEMBER: SPCA•ACM
PARENT:	WILLIAM Q	444 55 6656 P-MATH 705/3•985 ADVISOR: DR A C BROWN	SEX: M MARITAL ST:S GR:N
OTRS	ATTENDED FTU/STATUS:	LOCAL TEL:	MEMBER:

FIGURE 3
STUDENT ROSTER BY FACULTY ADVISOR

DEPARTMENT OF MATHEMATICAL SCIENCES
FACULTY ADVISOR LISTING
GRADUATE MATHEMATICAL SCIENCE MAJORS
MAY 26 1976

STUDENT	FACULTY ADVISOR
JONES	DR. JONES
JORGENSEN	DR. R. DUTTON
WASHINGTON	GEORGE C.

FIGURE 4

STUDENT-FACULTY ADVISOR LISTING

DEPARTMENT OF MATHEMATICAL SCIENCES

MAY 26 1976

THE FOLLOWING NAMED STUDENTS ARE ADVISEES OF DR. A. C. BROWN

BAXTER	JIMMY RUD
CONROY	MARY ELLEN
LEU	LEE SHU
SHOEMACHER	WILLIAM B.

FIGURE 5

LISTING OF STUDENTS ADVISED BY EACH FACULTY MEMBER

DEPARTMENT OF MATHEMATICAL SCIENCES

STUDENT ENROLLMENT

MAY 26 1976

711

	COMP	MATH	STAT	TOTAL
UNDERGRADUATE	3	0	3	6
GRADUATE	2	3		5
POST BAC	3	3		6
TOTAL	8	6	3	17

704

	COMP	MATH	STAT	TOTAL
UNDERGRADUATE	3	0	3	6
GRADUATE	2	3		5
POST BAC	3	3		6
TOTAL	8	6	3	17

703

	COMP	MATH	STAT	TOTAL
UNDERGRADUATE	1	1	3	5
GRADUATE	3	3		6
POST BAC	3	3		6
TOTAL	7	7	3	17

694

	COMP	MATH	STAT	TOTAL
UNDERGRADUATE	1	1	3	5
GRADUATE	3	3		6
POST BAC	2	3		5
TOTAL	6	7	3	16

692

	COMP	MATH	STAT	TOTAL
UNDERGRADUATE	3	0	3	6
GRADUATE	3	3		6
POST BAC	1	3		4
TOTAL	7	6	3	16

FIGURE 6

STUDENT ENROLLMENT REPORT

of required data extracted from the FTU Student Records.

5. The system must operate on the CFRDC facilities.

SIS CONCEPT

SIS can be described in terms of three general (somewhat simplified) processes as shown in figure 7. These are: update the MATH-DATA-BASE file; load the SPIN-OFF file; and generate reports.

The MATH-DATA-BASE file is one of two data bases maintained by the Department of Mathematical Sciences (the other is the STAT-HIST file which is discussed below). This data base contains four data fields for each student record; faculty advisor name and SSN (Social Security Number), student attendance/status data, student association membership data, and the student SSN which is used to key the student MATH-DATA-BASE record to the FTU Student Record. Additions, changes, and deletions to this data base are made using punched cards. The latter are read into a temporary MATH-CHANGE file where they are sorted and then merged with the MATH-DATA-BASE into a temporary MATH-REORG file. This is then read back into the MATH-DATA-BASE.

The temporary SPIN-OFF file is loaded with selected data fields from FTU records of all students with majors of COMP,

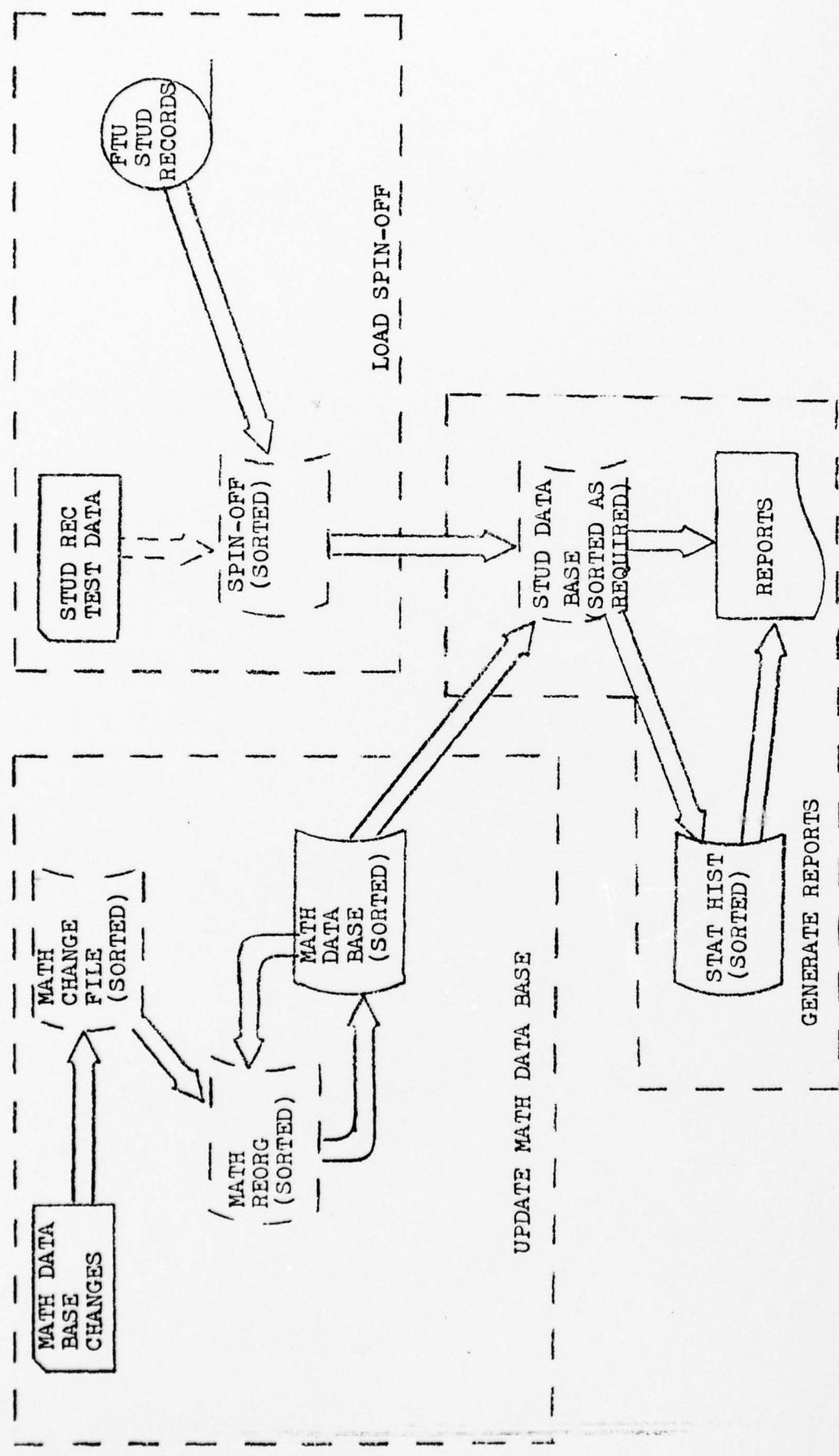


FIGURE 7
SIS OVERVIEW DIAGRAM

MATH, or STAT (an alternate method for loading SPIN-OFF with test data is also provided). Whenever SIS is run, it retrieves the SPIN-OFF file records and uses the data to construct a temporary STUD-DATA-BASE file.

When a report is requested, the records from the MATH-DATA-BASE are merged into the STUD-DATA-BASE, which is then sorted on various combinations of keys to provide the requested reports. Whenever a statistics report is requested, a new set of current student enrollment statistics is compiled and added to the STAT-HIST file before the report is generated.

SIS SYSTEM DESIGN

The System design was developed and implemented through use of IBM's Hierarchy plus Input Process Output (HIPO) technique for system design. This involves the use of system specifications (already discussed), a hierarchical Visual Table of Contents (VTOC) (figure 8), and corresponding Input-Process-Output diagrams (appendix D).

The result of this design process is a modular, structured system design, as indicated in the VTOC. Each module is "called" by its higher module and, in turn, calls its lower modules. This approach has greatly simplified the design process. It also facilitates maintenance and changes because the appropriate module can be quickly located, and usually any changes made to it will only affect its "parent" and

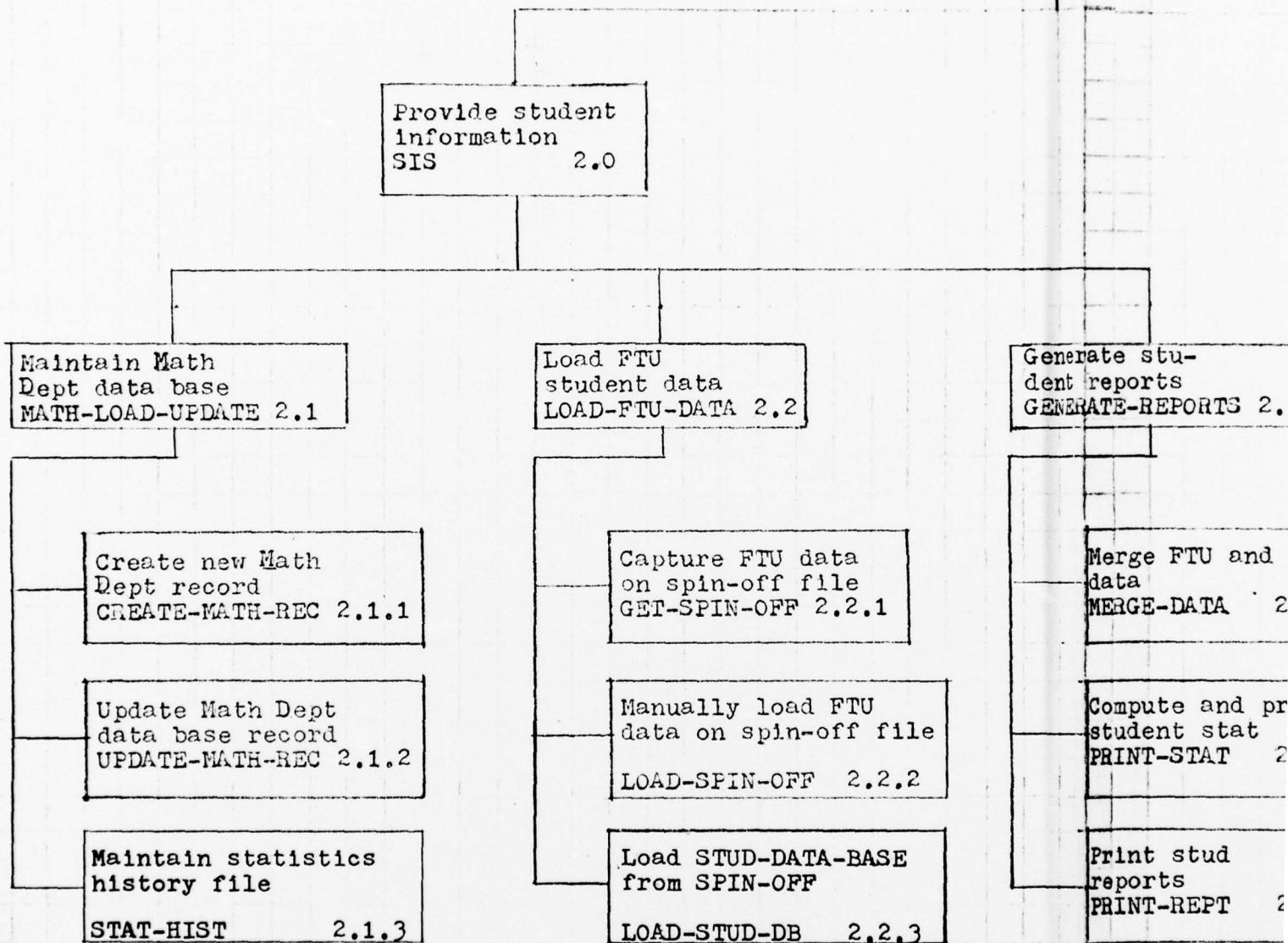


FIGURE 8

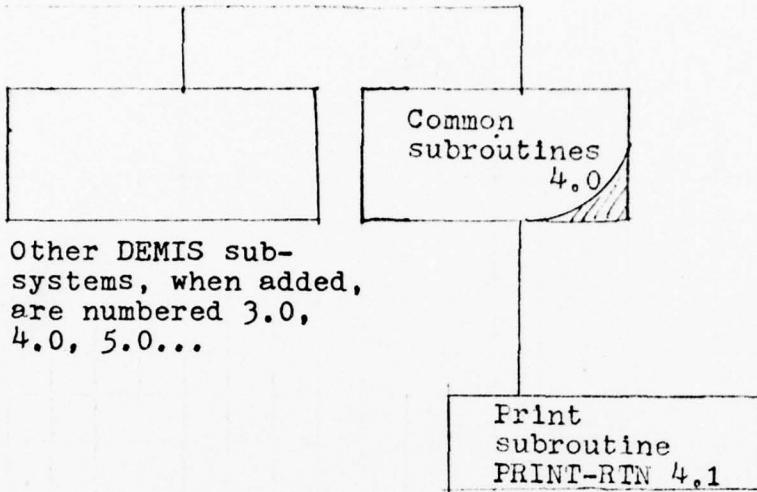
HIPO VISUAL TABLE OF CONTENTS (VTOC)

IBM HIPO WORKSHEET

Author: Roger Sifrit System/Program: DEMIS
 Diagram ID: Name: VISUAL TABLE OF CONTENTS

Date: 3/6/76 Page: 1 of 1
 Description: DEPT OF MATH SCI INFO SYSTEM

GX20-1970-0 U/M 025*
 Printed in U.S.A.



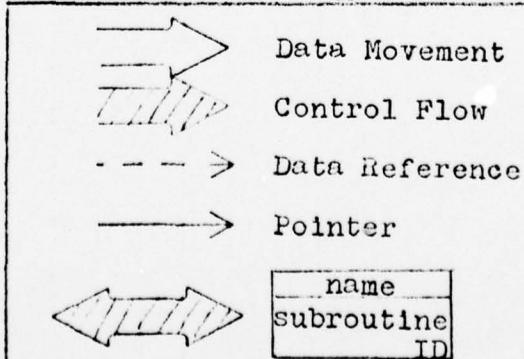
Generate student reports
GENERATE-REPORTS 2.3

Merge FTU and math data
MERGE-DATA 2.3.1

Compute and print student stat
PRINT-STAT 2.3.2

Print stud reports
PRINT-REPT 2.3.3

LEGEND



Subroutine is executed and control returns to next step.

"offspring" modules.

The Input-Process-Output diagrams, one of which is provided for, and keyed to , each module in the VTOC, visually and narratively describe the logic, the required inputs, and the outputs produced by each module. The coding was produced so that each module is implemented in a "section" of code which can quickly be identified for maintenance purposes.

Every attempt has been made to use corresponding terms in the VTOC, the Input-Process-Output diagrams, and in the coding.

Close coordination has been made with personnel at the FTU Computer Center, to ensure the compatibility of DEMIS with the FTU Student Records System and to facilitate the use of student record data by DEMIS.

SIS FILE DESIGN

The files used by SIS include two permanent files, five temporary files, and a variety of utility sort files. The two permanent files were established to store Mathematics Department unique data (MATH-DEPT-STUD-DB) and student enrollment data (STAT-HIST-DB).

Prior to running SIS a temporary file, SPIN-OFF, must be loaded with certain data from the FTU Student Records (figure 9). This data is placed in a temporary STUD-DATA-BASE file. The MATH-DEPT-STUD-DB is then merged into the

```

2LAST-NAME          PIC X(18).
2FRST-MDLE-NAME   PIC X(30).
2SSN               PIC 9(09).
2APPL-TYPE         PIC 9(01).

2MAJOR-1           PIC 9(04).
2FTU-SUMMARY      PIC 9(03).
2FTU-LAST-QTR    PIC 9V999.
2FTU-GPA          PIC X(01).
2SEX               PIC X(200).
2INDX              PIC X(01).
2GRD-IND          PIC X(02).
2START-SUB        PIC X(02).
2END-SUB          PIC X(02).
*      2HOME-STREET    PIC X(20).
*      2HOME-CITY     PIC X(20).
*      2HOME-STATE    PIC X(02).
*      2HOME-ZIP      PIC 9(05).
*      2HOME-PHONE    PIC X(10).
*      2KIN-STREET    PIC X(20).
*      2KIN-CITY      PIC X(20).
*      2KIN-STATE     PIC X(02).
*      2KIN-ZIP       PIC 9(05).
*      2MARITAL-STATUS PIC 9(01).

```

NOTE: DATA REQUIRED FOR ALL STUDENTS EVER ENROLLED IN FTU
 WITH MAJOR CODE OF 0701, 1701, 1702, OR 1790

FIGURE 9
 SPIN-OFF INPUT FROM FTU STUDENT RECORDS

STUD-DATA-BASE, to provide for generation of the required reports. Each time new enrollment statistics are generated, they are added to the STAT-HIST-DB to provide a continuous record of enrollment data.

All files used by SIS are sequential. The decision to use sequential files was made based on consideration of the following factors:

- a) it is anticipated that large volumes of data will be processed,
- b) data from the FTU Student Record Data Base will be sorted in sequence of SSN,
- c) conversion from disk to tape, if required, will be facilitated,
- d) data must be repeatedly sorted on different keys to produce the required outputs,
- e) MATH-DEPT-STUD-DB is stored sequentially by SSN, so that change data can be placed on a file, sorted on SSN, then merged with the MATH-DEPT-STUD-DB, and
- f) numerous and frequent changes to the SIS data bases are anticipated which makes other types of files (e.g. ISAM) inefficient.

SIS CODING

DEMIS was coded using COBOL, primarily to facilitate

interfacing with the FTU Student Record System which also uses COBOL. The coding has followed the logic of the HIPO system design, but, of course, is in more detail and includes numerous error checking routines (appendix A) which are not reflected in the HIPO design package. In other cases, where some of the higher level language characteristics of COBOL result in instructions which accomplish a variety of actions, the HIPO diagrams might be more detailed than the coding.

Every effort has been made to use the self-documenting characteristics of COBOL. Storage areas, variables, file names, paragraph names, and section names are written in a descriptive way, providing hopefully meaningful mnemonic names.

Every effort has also been made to provide easy to understand logic flow throughout the program. This, coupled with the program modularity, should facilitate reading of the code. Wherever possible, coding has been designed for clarity, even at the expense of efficiency. Package routines and other features are used wherever possible (e.g. COBOL sort-merge feature and string option).

Chapter 3

USER PROCEDURES FOR SIS

GENERAL

SIS has been designed to require minimum operator training and involvement. It provides a relatively foolproof system providing the procedures listed below are followed.

Many errors in keypunching and out of sequence card input will be detected by SIS and a warning message provided. Some errors, however, cannot be detected by the system (e.g. SSN or spelling of name, address, etc.). Critical data should be double checked by the keypunch operator. Of particular importance is SSN because it is used as the key to locate and update records in most of the files.

All reports can be obtained without complete MATH-DEPT-STUD-DB records. Report formats which are keyed to advisor SSN will, however, be affected by the absence of faculty advisor data (this is further explained below).

MAINTAINING THE MATH-DATA-BASE

The primary task of operating SIS is the maintenance of the MATH-DEPT-STUD-DB. All other data is automatically computed (i.e. statistics) or is provided from the FTU Student Record Data Base.

Changes to the MATH-DEPT-STUD-DB refer to introducing

data into a student record, changing or deleting data in a record, or deleting an entire student record. These changes are accomplished by key punching and inputting cards in the appropriate format (figure 10). When this data is entered into the computer, a search will be made using SSN as a key, to see if a record exists for that particular student. If one does exist, it will be updated. If no record exists, a new record will be created using whatever data is submitted.

There are three data items, in addition to SSN, which must be maintained for each student; faculty advisor (name and SSN), quarters attended FTU and status, and association memberships. The latter two items are for information only (i.e. not used as sort keys) and their absence will in no way affect the operation of SIS (other than blank fields on the printouts). Incomplete faculty advisor data, however, will change the output formats because several reports are keyed to the advisor SSN. All students without an assigned faculty advisor are grouped together as having no assigned advisor.

Building the MATH-DEPT-STUD-DB will be a time consuming process and it is recommended that the data be phased in starting with faculty advisor input.

Sequencing of MATH-DEPT-STUD-DB card changes is immaterial. They are sorted by SIS before any records are updated. There is no need, for example, to place two changes pertaining to the same student physically together in the group of MATH-DEPT-STUD-DB changes.

RUNNING SIS

The following conditions must be met before output can be obtained from SIS.

1. The SPIN-OFF file must be created from the FTU Student Records.
2. The MATH-DEPT-STUD-DB file must have been created.
3. The STAT-HIST file must have been created.
4. SIS must be catalogued.
5. The execution deck must be loaded.

The SPIN-OFF file is created by the FTU Computer Center.

This should be accomplished as soon as possible after the start of each academic quarter, once the INDEX field of all FTU student records has been updated. It will normally require several days notice for personnel at the center to create this file.

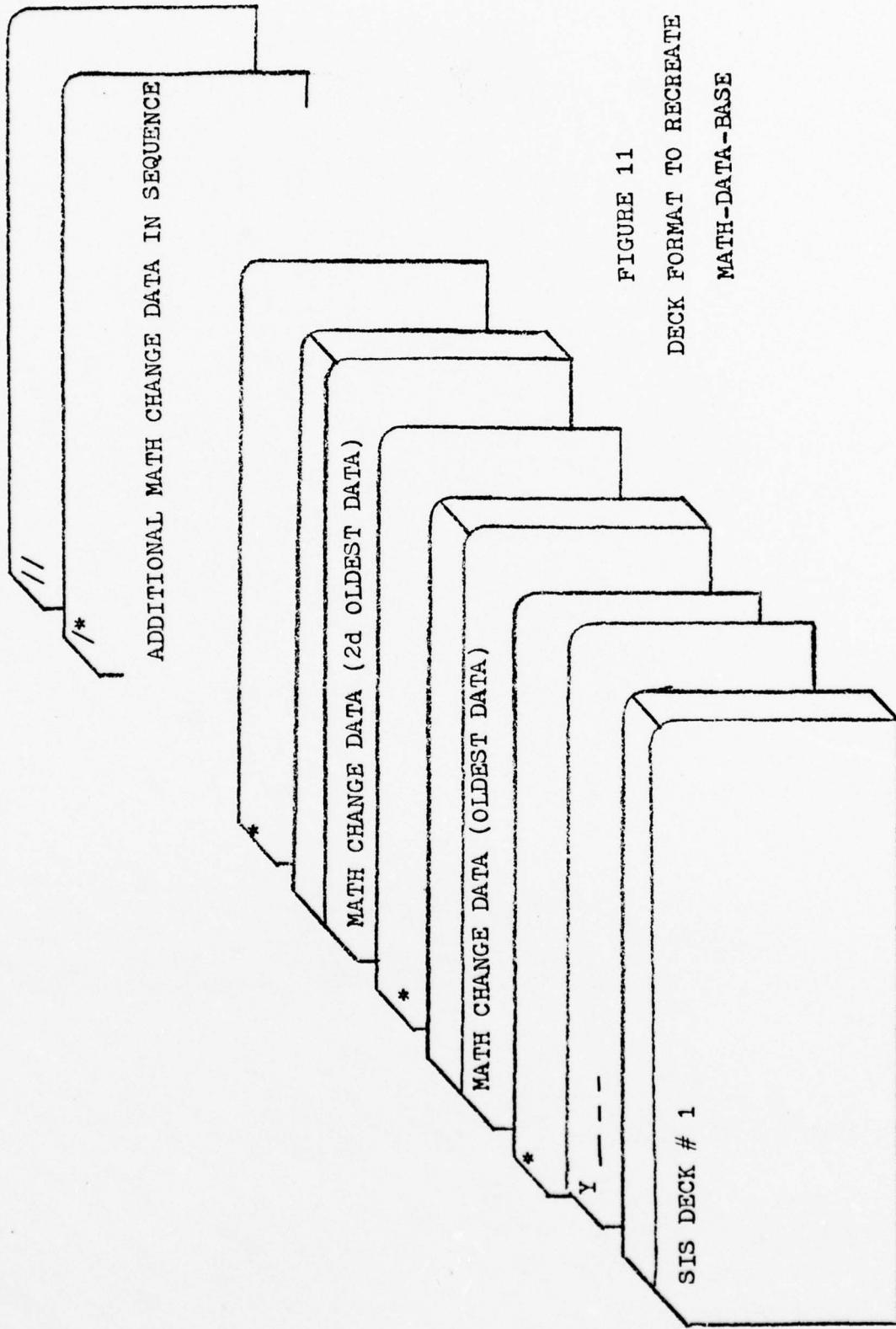
The MATH-DEPT-STUD-DB file is permanently stored. However, should the file be destroyed, it must be regenerated before SIS will work. To accomplish this, load DECK #3 (appendix E) into the card reader and verify the creation and cataloging of the file from the printed listing. This will recreate the MATH-DATA-BASE file without student data. Reloading student data is accomplished by rerunning all previously run changes to the data base, in the same sequence in which they were originally run, with each data deck separated

by a card with an '*' in column #1 (see figure 11). The effect of this procedure is to recreate the data base exactly as it had been previously built. The old change cards must, therefore, be saved and kept in a secure location. They form a data backup for use in case the MATH-DEPT-STUD-DB is damaged or destroyed.

The STAT-HIST file, like the MATH-DEPT-STUD-DB, is a permanent file. If it should be destroyed DECK #4 (appendix E) must be loaded to recreate the file (without data). To reload the data into the file there are two alternate procedures. The first is to recreate the history data as discussed in "Creation of STAT-HIST Data Base" below. The second is to take the most recent printout and use the information there to complete an 'H' card (figure 12) for each quarter in which data is available. The latter procedure is probably the best approach, and will provide a permanent backup deck. The backup deck may then be loaded with the next SIS run.

SIS is permanently catalogued on the CFRDC system, however should it be destroyed, it may be recatalogued by loading DECK # 2 (appendix C).

The execution deck consists of several items (figure 13), which must be in proper sequence. DECK #1 contains the instructions which call SIS to execute the program. This must be immediately followed by a 'Y' card (figure 14). This



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BOGGER W. STEBBITT

BOGEB W. STEBBLT

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ALTER STAT = HIST DATABASE - 'H' FORMAT
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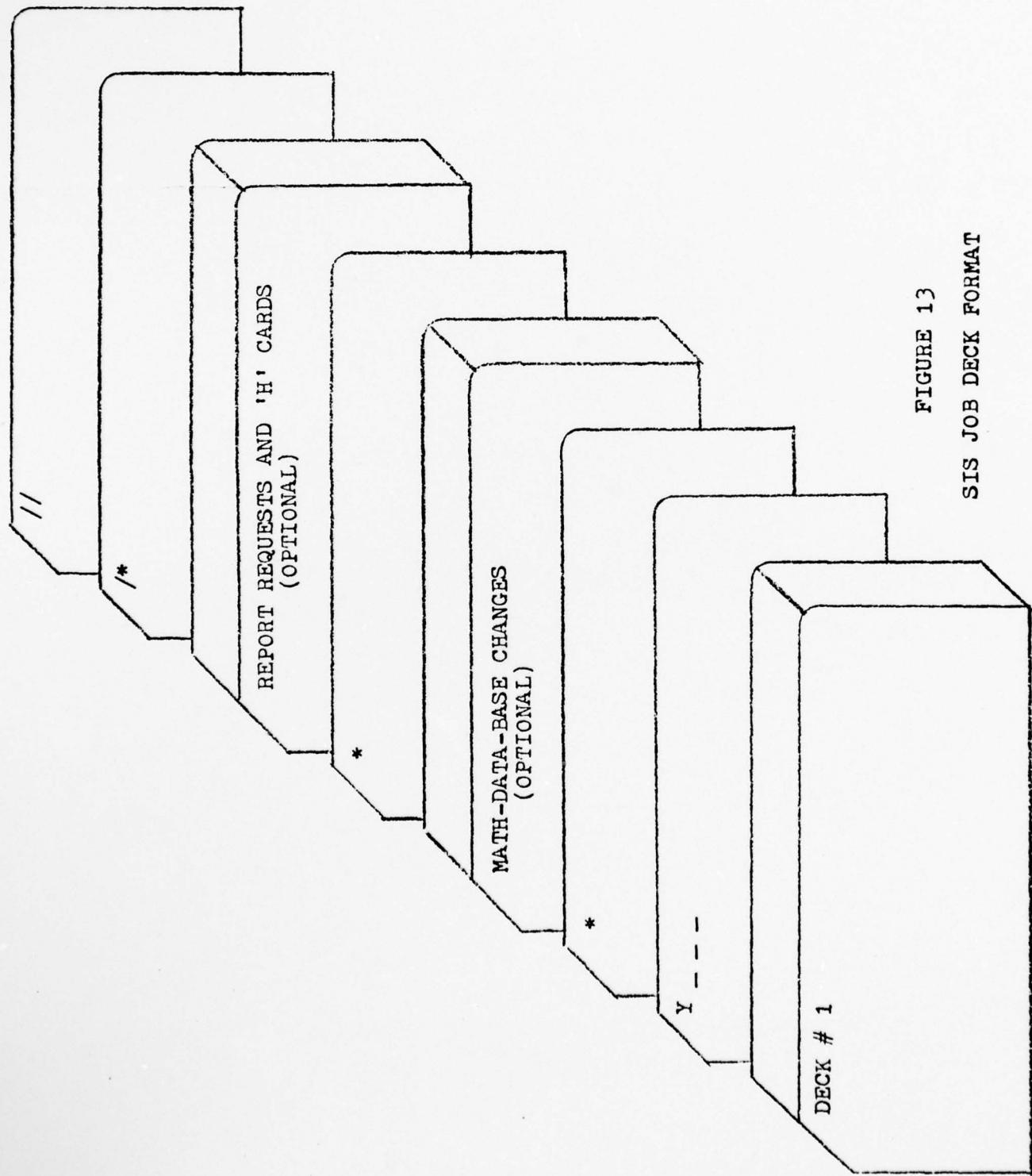
NOTES: 1. COLUMNS 2 THROUGH 32 MUST EACH CONTAIN A DIGIT 0 THROUGH 9.
 2. CURRENT QTR CODE IS THE QUARTER FOR WHICH THE STATISTICAL
 DATA IS TO BE CHANGED. USE DATA FOUND IN APPENDIX B.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

STAT-HIST CARD INPUT FORMAT

32

STAT-HIST CARD INPUT FORMAT



NOTE: DO NOT USE THIS FORM
WHEN ORDERING NEW OR REVISED
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Application

SIS 'Y' FORMAT

by Roger W. Siffrit

Date 3/6/76

Job No. _____
Sheet No. _____

YEAR AND QUARTER - 'Y' FORMAT

CURRENT QUARTER ENTRY FROM APPENDIX B

Y	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34

9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34

9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34

9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34

9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34

FIGURE 14

YEAR - QUARTER 'Y' CARD INPUT FORMAT

34

9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34

card supplies SIS with the present academic year and quarter. Based on this information a search of student records pertaining to that quarter is made. Failure to enter a 'Y' card will cause an immediate termination of the program. Use of incorrect data on this card will cause the wrong data to be searched in the student records, with undeterminable results. The 'Y' card contains four characters. The first character is the letter 'Y'. This is followed by three numbers representing the current fiscal quarter (appendix B). A card with an '*' in column 1 must follow the 'Y' card. Failure to enter an '*' will cause the first MATH-DEPT-STUD-DB change card to be ignored, and a message to this effect will be printed (appendix A). It may also cause damage to the SPIN-OFF file. The next items in the deck are the MATH-DEPT-STUD-DB changes. They may be in any sequence. The system will sort them prior to posting changes to the MATH-DEPT-STUD-DB records (changes are optional when SIS runs). An '*' must follow the changes. Report requests (figure 15) follow, and may be run in any sequence (report requests are optional).

CREATION OF STAT-HIST DATA BASE

The 'Y' card, as mentioned above, indicates to SIS which quarter is to be searched in the SPIN-OFF file (FTU Student Data) to determine current enrollment and statistical data.

To access data from previous quarters, the 'Y' card must indicate the quarter for which data is to be collected. Therefore, to build the STAT-HIST-DB file, successive runs of SIS must be made, starting with the first quarter (691) up to the current quarter. The quarters are listed in appendix B. This data is automatically stored in the STAT-HIST-DB file and printed with each 'C' report request.

The data deck required to build the STAT-HIST-DB is shown in figure 16.

CHANGING / DELETING DATA FROM THE STAT-HIST DATA BASE

Statistical data stored in the STAT-HIST-DB file may be altered or deleted by using an 'H' format card (figure 12). To add new data, complete the card, as shown in figure 12, with an 'H' in column 1 and numeric data (0-9) completely filling columns 2 through 32. Failure to enter data as required will cause the 'H' card to be disregarded by SIS. To delete an entry from STAT-HIST-DB file, enter the date which is to be deleted, then fill columns 8 through 32 with '0's.

REPORT FORMATS

Report formats are shown in figures 2 through 6. The student enrollment report (figure 6) will display all history data in the STAT-HIST-DB file, with the most recent

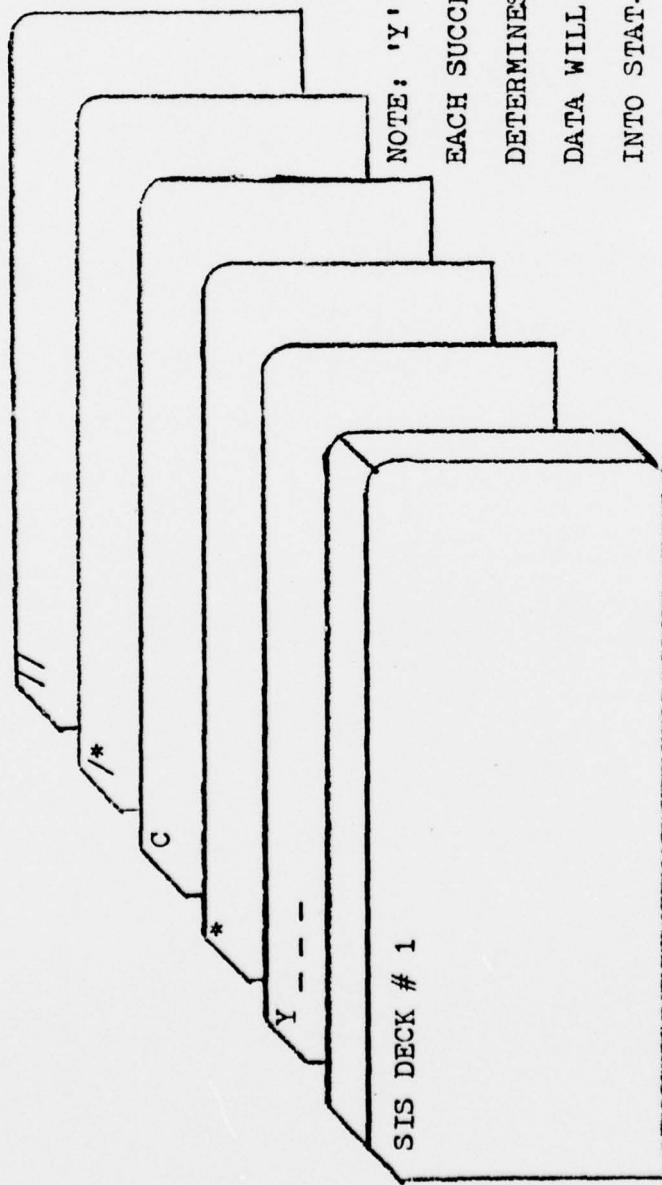


FIGURE 16

DECK FORMAT TO BUILD
STAT-HIST-DB

statistics displayed first. A new entry will be made to the STAT-HIST-DB file every time a 'C' report (figure 15) is requested. If an entry already exists in the file for the quarter indicated on the 'Y' card, the new data which is generated will update the existing entry.

The 'R' report produces two sets of reports (figure 2 and 3): a roster of students currently enrolled by major and level of study, and the same data grouped by faculty advisor.

The 'A' report (figure 5) provides one listing for each faculty advisor showing the students he advises. Those students who are not assigned an advisor will appear on one listing, and new / temporary advisor names may be manually entered on the printout.

The 'F' report (figure 4) produces a student-faculty advisor listing by major and level of study.

ERROR MESSAGES

SIS incorporates a number of error checking routines. When an error is detected, a message is printed out to advise the user of the problem, what action SIS has taken, and in some instances what further action the user should take. Once the error message is printed, SIS continues to execute if at all possible. It is, therefore, essential that each output produced by SIS be reviewed and, if error messages occurred,

corrective action should be taken by the user. To this end a complete list of SIS generated messages, along with appropriate user responses, appears in appendix A.

Chapter 4

MAINTENANCE OF SIS

GENERAL

Problems arising from SIS operation should be easy to isolate and correct using the documentation provided with this package. This documentation includes the HIPO package (figure 8, appendix D) and a listing of SIS. Other figures found in this report should also be of use in the maintenance of SIS.

SIS has been designed in a modular fashion in the anticipation that additional DEMIS modules will be designed to interact with SIS to perform other functions. Expansion of the MATH-DEPT-STUD-DB, provided that it is accompanied by an identical expansion of the associated sort file, will not affect the operation of SIS. All data transfers, to and from the data base, use the COBOL MOVE CORRESPONDING option. This option has been used so that the locations of the corresponding fields within the sending and receiving records is not critical. This principle holds true for modifications in the SPIN-OFF data received from the FTU Student Records.

For testing purposes, SIS incorporates a procedure for loading the SPIN - OFF file using card input test data. This data is designed to be input in card form using the format

described in figure 17. This data is provided as DECK # 5 for future use and when used should follow the input sequence shown in figure 18. Should additional FTU Student Record data be required by SIS or new DEMIS subsystems, it may be simulated, for test purposes, by defining additional card input formats, adding additional fields to the description of the SPIN-OFF file and its associated sort file, and making appropriate changes to the LOAD-FTU-DATA section.

Should additional MATH-DEPT-STUD-DB fields be required, new card input formats must be defined and additional fields added to the MATH-DEPT-STUD-DB, its associated sort file, and the MATH-CHANGE file. The program sections which process the MATH-DEPT-STUD-DB must also be appropriately modified.

SIS - FTU STUDENT RECORD INTERFACE

A SPIN-OFF file has been temporarily created to contain extracts of the FTU Student Records on all students whose major is COMP, MATH, or STAT. Once this data has been loaded into the SPIN-OFF file by the personnel of the FTU Computer Center, it is available for use by SIS.

The format and data required for the SPIN-OFF file is as shown on the SIS listing (appendix C) as the SPIN-OFF-FD data record. The fields of this record are formatted exactly as the corresponding fields in the FTU Student Record Data Base except for a '2' prefix for each field descrip-

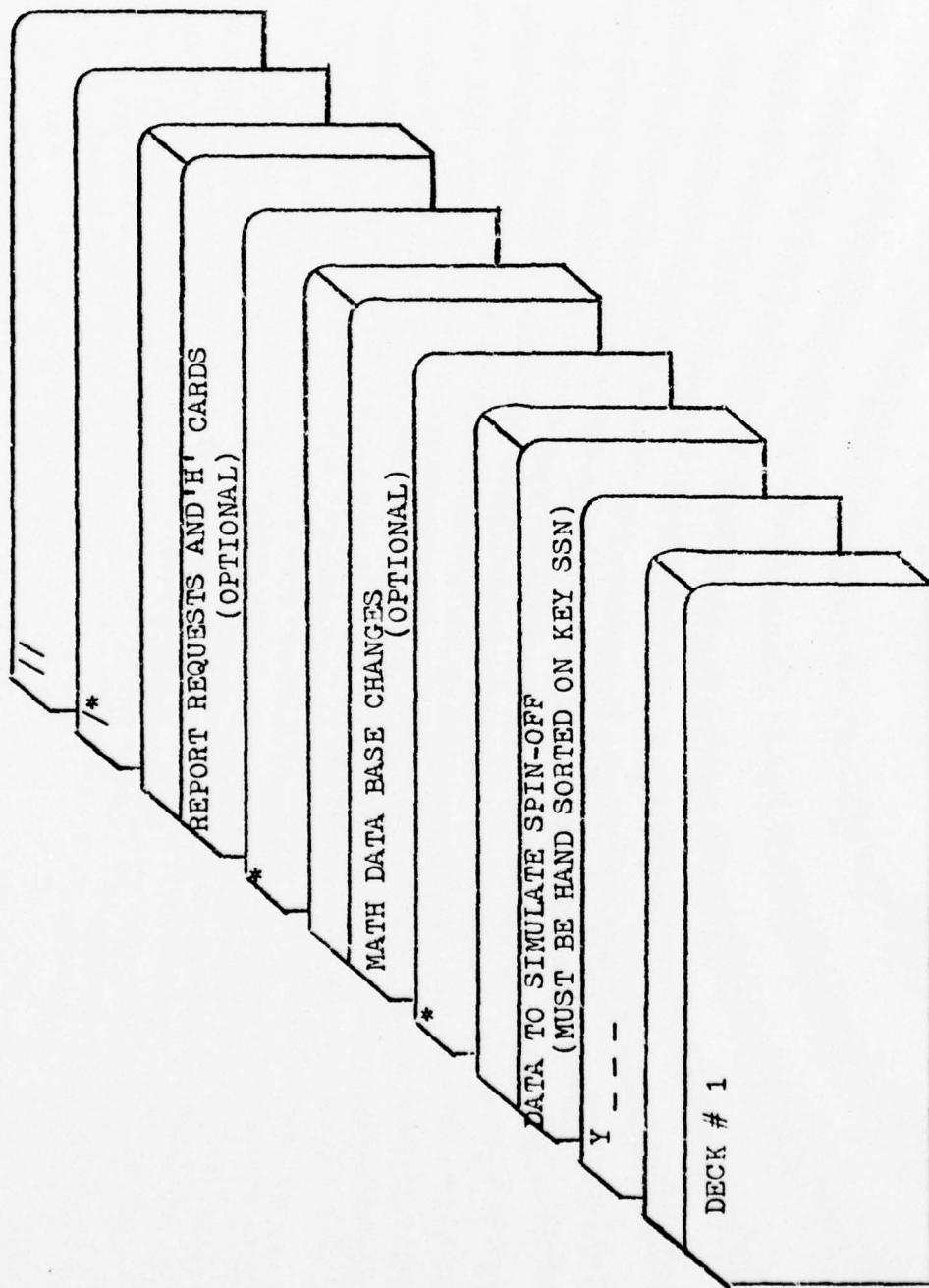


FIGURE 18
DECK FORMAT TO LOAD SPIN-OFF WITH TEST DATA

tion on the FTU Student Record format (e.g. 'LAST-NAME' of the SPIN-OFF-REC of SIS is the receiving field of '2LAST-NAME' of the FTU Student Record). The data description for the required FTU Student Record input is shown in figure 9. The picture description and length of all SPIN-OFF fields are identical to the corresponding record formats of the FTU Student Record Data Base.

TIME PARAMETER ADJUSTMENTS

Periodic reviews should be made of the time limit parameters assigned to SIS (both CPU and I-O). Should the actual run times exceed the present limits, appropriate adjustments must be made to the job card in DECK #1.

HIP0 / SOURCE LISTING CORRESPONDENCE

The following procedure may be used to help locate a specific area of SIS where a program modification is to be made:

- 1) locate the area in question on the HIP0 VTOC,
- 2) refer to the I-P-O diagram whose number is referenced by the VTOC,
- 3) when the appropriate I-P-O diagram is found, locate the reference note in the source listing for that particular I-P-O diagram, and

- 4) read the code to locate the appropriate coding to be modified.

The source program for SIS is available at two locations. The original SIS deck is stored in the Department of Mathematical Sciences office. The source listing is also recorded on magnetic tape in the CFRDC PANVALET system.

FILE MAINTENANCE

Periodically, SIS should be reviewed to determine if the file space allocation requires modification. Initially SIS was created with the minimum allocation of "SPACE=(TRK,(1,1))". This limit should cause no problems in executing SIS. As certain data bases increase in size, however, inefficiencies may develop and the space parameters should be adjusted.

The sort file work areas used by SIS have space parameters of "SPACE=(TRK(20),,CONTIG)", which should be adjusted upward if the sort merge routines develop problems or if they appear to be inefficient due to an increase in the length of the data files. The first indication of the space problem in sorting will be encountered during a sort-merge of the STUD-DATA-BASE. Adjustments of these space parameters require changes to JCL cards for SORTWK01, SORTWK02, and SORTWK03.

Chapter 5

FUTURE DEVELOPMENT OF DEMIS

The following is a very generalized "framework" for the future development of DEMIS, and in keeping with the basic concepts of this paper, the framework should remain flexible and open ended. Possible additional modules of DEMIS are shown in figure 1 and discussed below. Naturally, before undertaking the development of a new module for DEMIS, the designer should determine the system requirements and specifications.

A Student Counselling Module for DEMIS would offer an increased scope of the counselling feature offered by SIS. The counselling module could provide a degree plan for students based on their areas of interest, program requirements, transfer credits and other appropriate considerations. It should produce a written program of instruction for each student, with a copy for his faculty advisor.

A Student Scheduling Module might receive input based on data made available by the Student Counselling Module, a student's program requirements, the work load each student desires to carry, and faculty availability. Projected offerings and a recommended schedule for each student for the following two or more quarters could then be made. Such a system would help optimize class sizes, provide an orderly sequence of course offerings for students, bring about optimum faculty

utilization, reduce faculty workloads and could possibly result in a tangible monetary savings to both students and the school. The facilities for computer science majors (e.g. computer facilities) could be better utilized. Certain programming courses might, for example, be concentrated during summer quarters when school attendance is low. During the remainder of the year a more balanced schedule of programming and non-programming courses could be offered.

The FTU Alumni Association is currently investigating the development of a new computerized alumni information system. If these plans are realized, the data bases developed to support that system could be made available to DEMIS. Some of the information which might be of value would be a periodic listing of alumni and the type of jobs they hold. This would be valuable for curriculum development and counselling and could provide feedback to faculty so that adjustments might be made to the approach and content of individual course offerings. The result could be dynamic, "self evaluating" curriculum development procedure for the Department.

A Departmental Statistical Summary Module may be designed to provide statistical data, primarily from other DEMIS modules and data bases, for management use within the department. Such data might include student enrollment, faculty qualifications and specialties, alumni employment, evaluation of the "strengths" of FTU students (based on course balance),

average grade evaluation, and other similar areas. This data could be used to support management decisions, to provide information to potential students, and to determine qualifications and prerequisites for admission based on the profile of a typical successful student. The information provided by this system might also provide a profile to be used in the selection of new faculty members.

These are some modules which may be added to DEMIS to increase the management type information available to the staff and faculty of the Department of Mathematical Sciences. In addition to supporting activities in the Department, several other benefits can accrue from development of DEMIS. The design and construction of additional modules as student projects can provide an excellent opportunity for students interested in computer business applications, and specifically management information systems. The experience gained in developing a production system cannot be matched in any other way and can integrate the formal course work of the student. It could better prepare the student for the business world by providing him with experience and confidence.

Other student projects might be realized in generalizing DEMIS so that it can be used in other departments.

CONCLUSION

SIS provides student information and is the initial module

of DEMIS. SIS is designed to be operated with a minimum of time, effort, and technical expertise, and it provides useful data to support administrative and student advisement activities within the Department of Mathematical Sciences.

The approach used to produce DEMIS is a valid concept in MIS development. While the case study presented in this paper pertained to an educational institution, it is equally applicable to an organization with existing ADP facilities and sufficient capacity to support an additional MIS.

The generalized flexible framework forces consideration of the other potential modules without the requirement for a formal study and the danger of delay in satisfying immediate information requirements. It also prevents the danger of becoming "locked" into a rigid framework which will not provide the flexibility necessary to meet rapidly changing information requirements.

The implementation of individual modules creates a quickly realizeable goal, and can produce tangible results in a short period of time. This makes this approach both attractive and economical.

The informal procedures to implement modules can, however, be dangerous. Certainly any large system which represents a sizeable and costly undertaking should meet formal procedural requirements as listed in Chapter 1.

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Appendix A
ERROR MESSAGES

ERROR MESSAGES

The error messages generated by SIS are listed below in alphabetical order with an appropriate user response. The more significant error messages generated will include an '*' as the first character of the error message. Note that where the message includes the comment 'THE FOLLOWING INPUT CARD DISREGARDED: (CARD TEXT)' that the referenced card has been completely ignored by SIS.

01 MSG: ATTENDANCE DATA ENTRY TO BE DELETED NOT FOUND. THE FOLLOWING INPUT CARD DISREGARDED: (CARD IMAGE)

User Response: A request was made to delete an attendance data entry, and the entry could not be found. Check for the correct SSN on input cards, check to make sure that column 1 has the correct code, and check previous listing of data to ensure that the entry to be deleted is exactly the same as on the listing. The listing should also be checked to ensure that previously entered incorrect data is not on the record (i.e. an inbeded space in the data string, a leading space in the data string, or a missing or extra character in the data string). If the input card is incorrect make appropriate changes. If an incorrect data string is found in

the student record the entire data field must be purged using a 'Z' format card followed on the next SIS run with a 'Q' format card with corrected attendance record data.

02 MSG: * CANNOT DETERMINE IF (STUDENT LAST NAME, STUDENT FIRST NAME, STUDENT SSN) IS GRAD, UG, OR PB - IS NOT INCLUDED IN STATISTICS.

User response: SPIN-OFF file does not show the level of study of the student indicated. If SPIN-OFF file is loaded from test data, an error is probably present in the test data. If SPIN-OFF file is loaded with FTU Student Record Data, then consult with the Data Base Administrator.

Note: Statistics reports will not include this student.

03 MSG: * CANNOT DETERMINE LAST QRT ATTENDED FOR (STUDENT LAST NAME, STUDENT FIRST NAME, STUDENT SSN). CHECK SPIN-OFF DATA AND CURRENT QRT INPUT.

User Response: SPIN-OFF file does not show the student indicated as being enrolled in the quarter specified on the 'Y' card or any previous quarter. If SPIN-OFF file is loaded with test data, an error is probably present in the test data. If SPIN-OFF file is loaded with FTU Student Record Data, then check for incorrect data on the 'Y' card. If 'Y'

card is correct consult the Data Base Administrator.

Note: Statistics reports will not include this student.

04 MSG: * CANNOT DETERMINE MAJOR OF (STUDENT LAST NAME, STUDENT FIRST NAME, STUDENT SSN) DATA NOT INCLUDED IN STATISTICS.

User Response: SPIN-OFF file indicates that the subject student is not a MATH, COMP, or STAT major. If SPIN-OFF file is loaded with test data, an error is probably present in the test data. If SPIN-OFF file is loaded with FTU Student Record Data, then consult with the Data Base Administrator.

Note: Statistics Report will not include this student.

05 MSG: CANNOT LOCATE RECORD TO BE CHANGED FOR SSN (SSN FROM INPUT CARD) THE FOLLOWING INPUT CARD DISREGARDED: (CARD IMAGE).

User Response: A request was made to delete or alter data in a student record in the MATH-DATA-BASE, probably with card format 'Z', 'X', or 'D'. The SSN on the change card did not match any record in the MATH-DATA-BASE, and so SIS could not make the correction. Check for proper code in column 1 of the change card, or for incorrect SSN in columns 2-10.

06 MSG: ENTRY TO BE DELETED NOT FOUND IN STATISTICS HIST FILE THE FOLLOWING INPUT CARD DISREGARDED: (CARD TEXT)

User Response: An 'H' change to delete an entry in the Statistics History file was made, and SIS could not locate the entry to be deleted. Check the date on the input card with a current listing for correctness, check the 'H' card format to ensure that the correct data is in columns 2 through 7 of the input card. If an addition was to be made to the Statistics History file, check for zeros incorrectly filling columns 8 through 32 of the input card.

07 MSG: * EXPECTED BUT DID NOT FIND * TO INDICATE END MARKER FOR SPIN-OFF. THE FOLLOWING INPUT CARD DISREGARDED: (CARD TEXT).

User Response: If SPIN-OFF is loaded with FTU Student Record Data, the first two input cards were not a 'Y' card followed by a card with an '*' in column 1. As a result, the SPIN-OFF data base has been damaged. Correct the job deck and rerun SIS after SPIN-OFF has been reloaded. If SPIN-OFF is being loaded with test data insert an '*' after the test data and rerun SIS.

08 MSG: * EXPECTED TO FIND * AT END OF MATH CHANGE CARD INPUT FOUND INSTEAD THE FOLLOWING DATA WHICH IS DISRE-

GARDED: * CARD IMAGE: (CARD TEXT).

User Response: A card with the asterisk in column 1 must immediately follow the last MATH-DATA-BASE change card. SIS found instead a character which was not a change request nor an asterisk. If a card with an asterisk in column 1 is missing, place one in the DECK (figure 13). If the card text indicates that it is for a MATH-DATA-BASE change, check the card format for correct code in column 1, and resubmit change. If the disregarded card was a report request, the report will not be generated.

09 MSG: ILLEGAL ENTRY ON HISTORY ALTERATION REQUEST. THE FOLLOWING INPUT CARD DISREGARDED: (CARD TEXT).

User Response: An 'H' card contains illegal data. Check proper format for 'H' card, repunch card and rerun SIS.

10 MSG: ILLEGAL ENTRY ON REPORT REQUEST. THE FOLLOWING INPUT CARD DISREGARDED: (CARD TEXT)

User Response: Column 1 of the input card contained a valid character to generate a report, however other extraneous data was found on the card. Check the input card for extraneous data (if it is a report request) or for an incorrect code in column 1 (if it is not a report request).

11 MSG: ILLEGAL ENTRY ON YEAR AND QUARTER INPUT CARD THE FOLLOWING INPUT CARD DISREGARDED: (CARD TEXT)

User Response: 'Y' card contains illegal data in columns 5 through 80 and was out of place. Probable cause is wrong use of 'Y' in column 1.

Check card and correct data in column 1.

12 MSG: ILLEGAL INPUT ON ADVISOR INPUT CARD THE FOLLOWING INPUT CARD DISREGARDED: (CARD TEXT)

User Response: 'V' card has blanks or alphabetic characters in columns 2 through 10 or numeric data appears in columns 11 through 80. Check 'V' format and correct the card (if input was intended to be a 'V' card) or check for an incorrect code in column 1.

13 MSG: INVALID CODE IN COLUMN 1 OF INPUT CARD. THE FOLLOWING INPUT CARD DISREGARDED: (CARD TEXT)

User Response: An unauthorized code was entered in column 1 of input card. Check proper format and enter correct code on card.

14 MSG: * INVALID CURRENT QUARTER SPECIFIED ON INPUT CARD - PROCESSING TERMINATING. THE FOLLOWING INPUT CARD DISREGARDED: (CARD TEXT)

User Response: 'Y' card contained an invalid quarter code. Check quarter code list (appendix B) for

correct conversion data, make correction and rerun SIS.

15 MSG: INVALID SSN ON INPUT CARD. THE FOLLOWING INPUT CARD DISREGARDED: (CARD TEXT)

User Response: Check input card SSN for blanks or non-numeric data in columns 2 through 10.

16 MSG: MEMBERSHIP ENTRY TO BE DELETED NOT FOUND. THE FOLLOWING INPUT CARD DISREGARDED: (CARD TEXT)

User Responses: A request was made to delete an association membership entry, however the entry could not be found. Check for correct SSN in columns 2 through 10 of input card, then ensure that the data to be deleted is exactly the same on both the input card and a current listing. Check to make sure that the correct code was entered in column 1 of the input card.

17 MSG: ** MISSING OR OUT OF SEQUENCE CURRENT QUARTER CARD PROCESSING TERMINATING THE FOLLOWING INPUT CARD DISREGARDED: (CARD TEXT)

User Response: 'Y' card was not found as the first card of the job deck as required. SIS has been aborted. Check job deck for proper placement of 'Y' card, then rerun SIS.

18 MSG: * NO INPUT FROM STUD DATA BASE.

User Response: While attempting to generate a

report, SIS found no data in the STUD-DATA-BASE. Probable cause is no data in SPIN-OFF file. If SPIN-OFF is loaded with test data, ensure that input deck is correctly formatted, then rerun SIS. If SPIN-OFF is loaded with FTU Student Record Data, then ensure that the first two cards of the job deck contain a 'Y' card immediately followed by a card with an '*' in column 1. If not, SPIN-OFF file has been damaged, and it must be reloaded before SIS is rerun. If the job deck is correct then attempt to rerun SIS. If the same error message is generated, consult with the Data Base Administrator.

19 MSG: * SSN (SSN OF STUDENT) NOT FOUND IN FTU SUPPLIED DATA. VERIFY SSN.

User Response: A student listed in the MATH-DATA-BASE (by SSN) cannot be located in SPIN-OFF file. If SPIN-OFF is loaded with test data, incorrect test data is the probable cause. If SPIN-OFF is loaded from FTU Student Record Data, then verify the correctness of the student's SSN in the MATH-DATA-BASE. If the student is a COMP, MATH, or STAT major, then consult with the Data Base Administrator. Note: Statistics report will not include this student.

Appendix B
CURRENT QUARTER TABLE

Appendix B

63

Current Quarter Codes

Academic Quarter	Current Quarter Code Recognized by SIS	Sequential Quarter
F68	691	01
W69	692	02
S69	693	03
U69	694	04
F69	701	05
W70	702	06
S70	703	07
U70	704	08
F70	711	09
W71	712	10
S71	713	11
U71	714	12
F71	721	13
W72	722	14
S72	723	15
U72	724	16
F72	731	17
W73	732	18
S73	733	19
U73	734	20
F73	741	21
W74	742	22
S74	743	23
U74	744	24

Academic Quarter	Current Quarter Code Recognized by SIS	Sequential Quarter
F74	751	25
W75	752	26
S75	753	27
U75	754	28
F75	761	29
W76	762	30
S76	763	31
U76	764	32
F76	771	33
W77	772	34
S77	773	35
U77	774	36
F77	781	37
W78	782	38
S78	783	39
U78	784	40

**Appendix C
SIS LISTING**

(LISTING IS EXTERNAL TO THE BOUND REPORT)

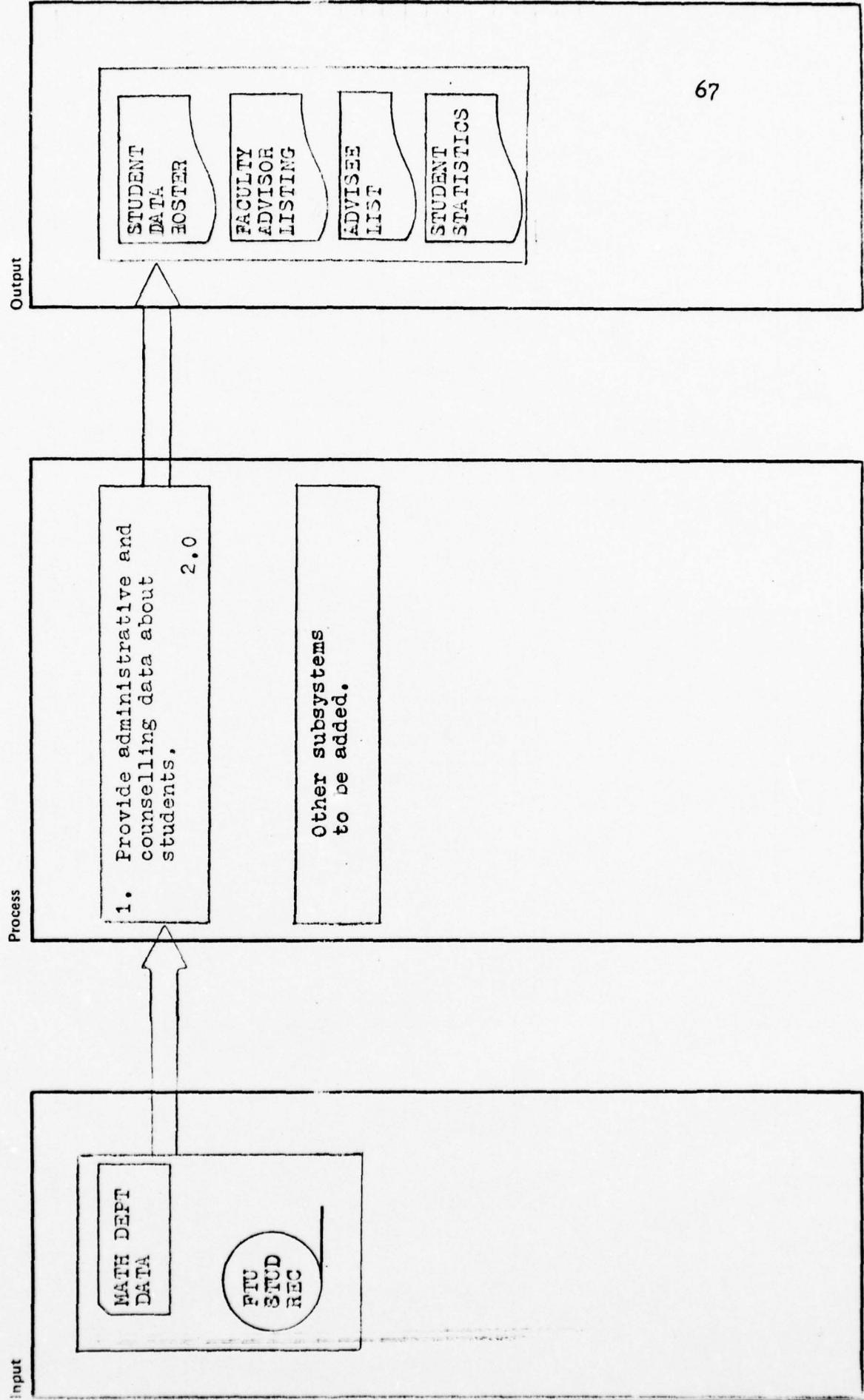
Appendix D
HIPO INPUT-PROCESS-OUTPUT (I-P-O) DIAGRAMS

HIPO WORKSHEET

GX20-1970-0 U/M 025 *
Printed in U.S.A.

Author: ROGER SIFRIT System/Program: DEMIS
Diagram ID: 1.0 Name: DEMIS

Date: 3/6/76 Page: 1 of 1
Description: DEPT OF MATH INFO SYSTEM



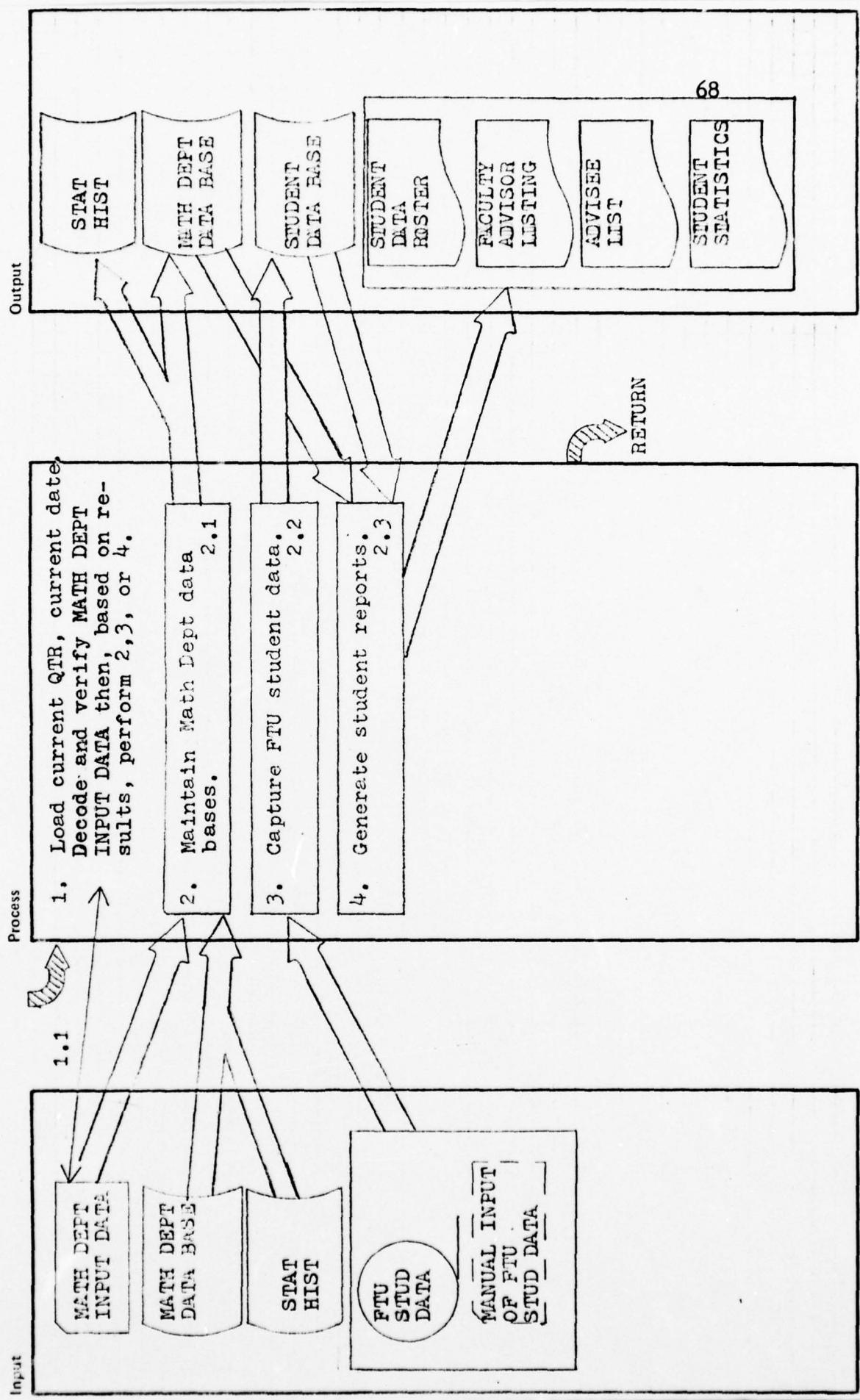
HIPO WORKSHEET

Author: ROGER SIFRIT System/Program: SIS
 Diagram ID: 2.0 Name: SIS

Date: 2/6/76 Page: 1 of 1

Description: STUDENT INFORMATION SYSTEM

GX20-1970-0 U/M 025 *
 Printed in U.S.A.



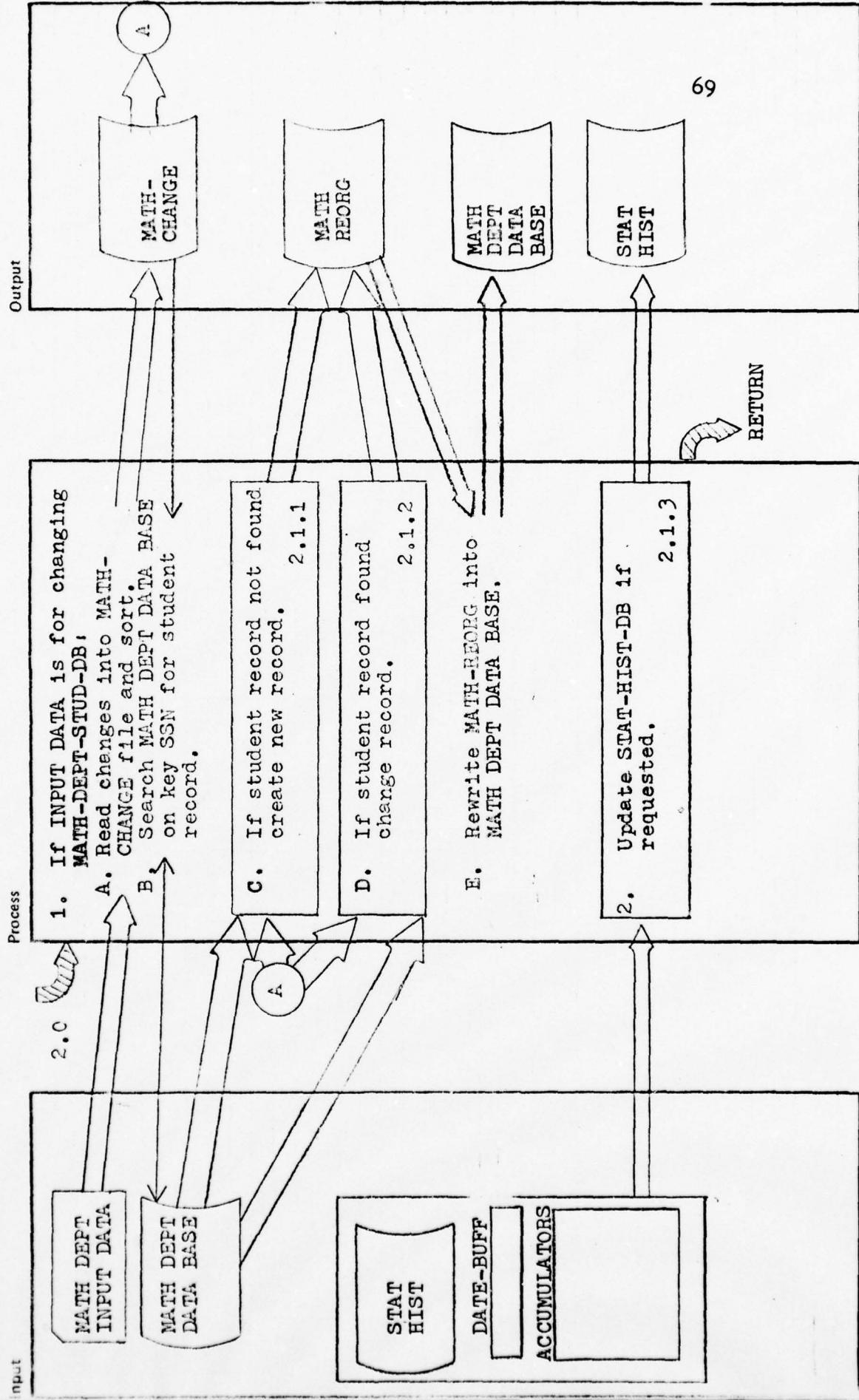
HIPO WORKSHEET

GX20-1970-0 U/M 025 *
Printed in U.S.A.

Author: ROGER SIFRIT System/Program: SIS
 Diagram ID: 2.1 Name: MATH-LOAD-UPDATE

Date: 3/6/76 Page: 1 of 1

Description: MAINTAIN MATH DEPT DATA BASE

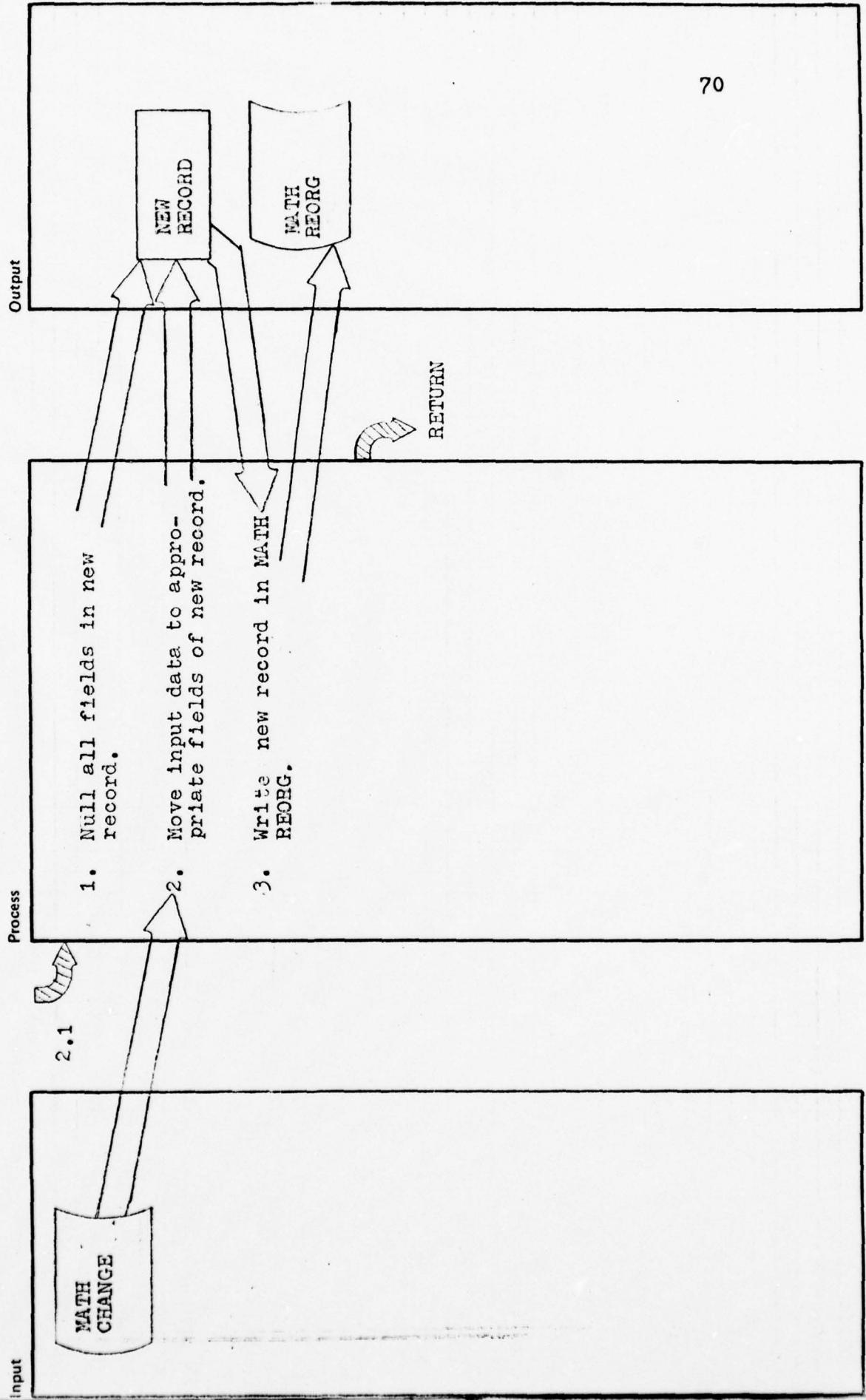


HIP WORKSHEET

GX20-1970-0 U/M 025 *
Printed in U.S.A.

Author: ROGER SIFRIT System/Program: SIS
 Diagram ID: 2.1.1 Name: CREATE-MATH-REC

Date: 3/6/76 Page: 1 of 1
 Description: CREATE NEW MATH DEPT RECORD

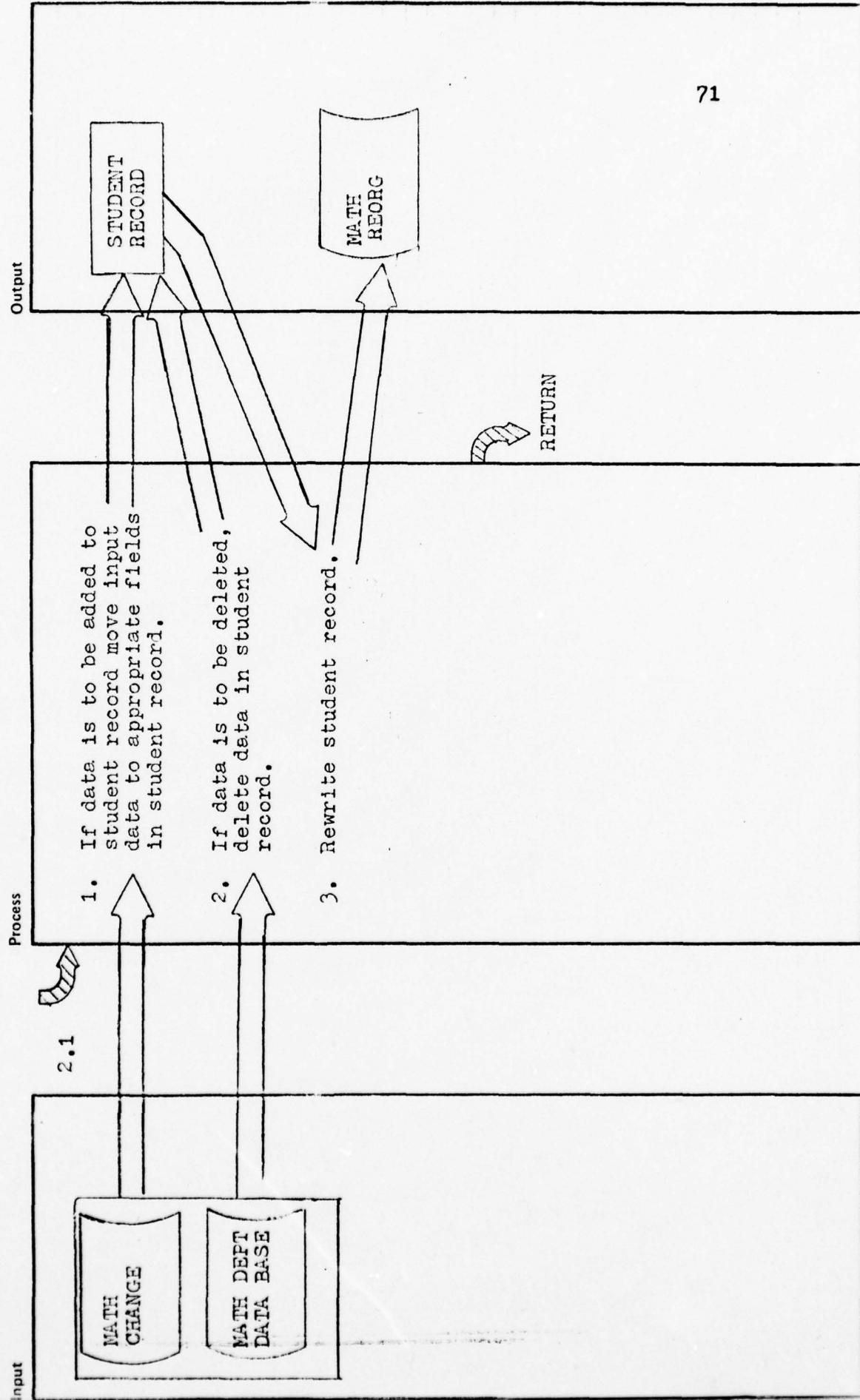




GX20-1970-0 U/M 025 *
Printed in U.S.A.

Author: ROGER SIFRIT System/Program: SIS
Diagram ID: 2.1.2 Name: UPDATE-MATH-REC

Date: 3/6/76 Page: 1 of 1
Description: UPDATE MATH DEPT DATA BASE RECORD

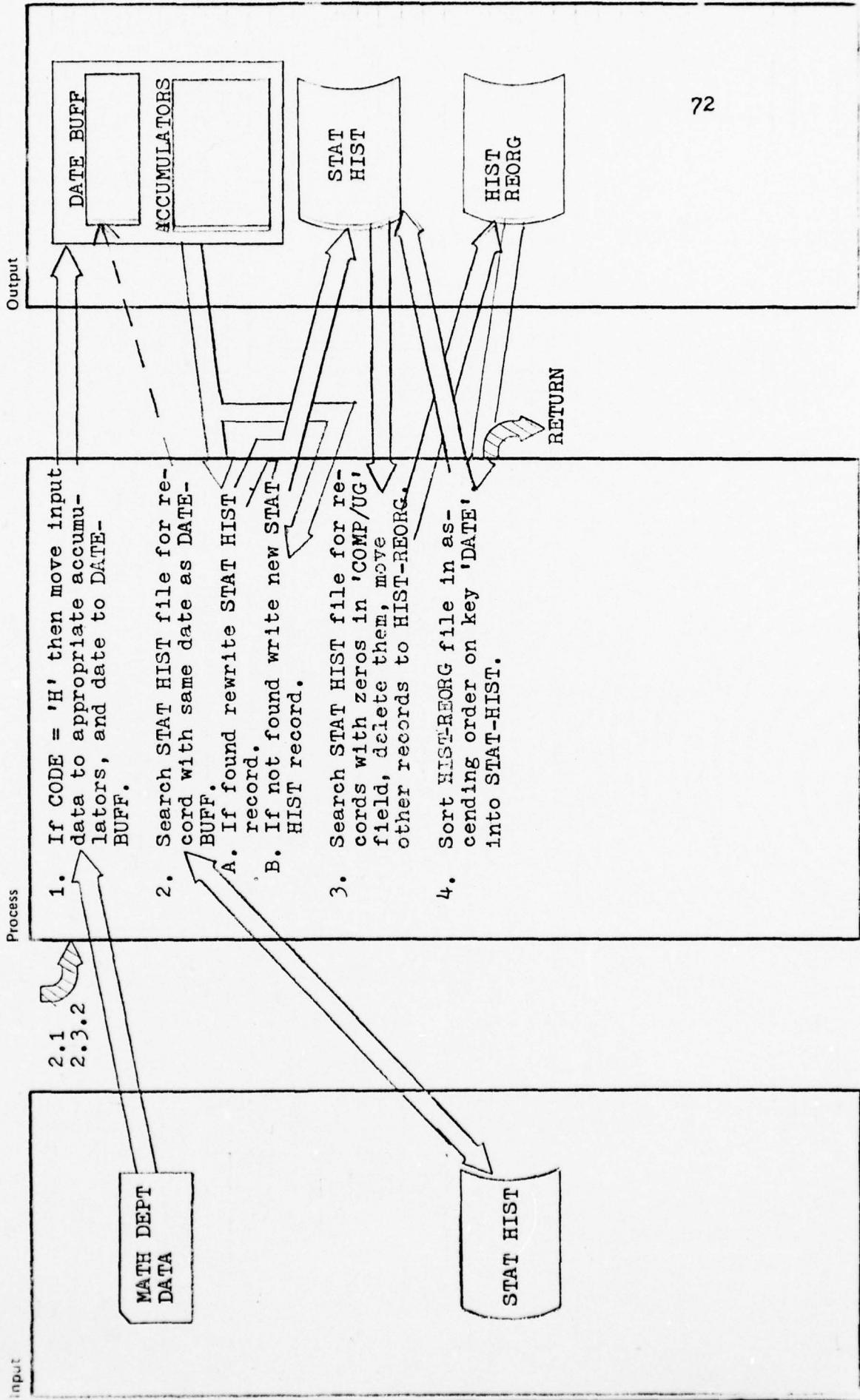


HIPO WORKSHEET

GX20-1970-0 U/M 025 *
Printed in U.S.A.

Author: ROGER SIFRIT System/Program: SIS
 Diagram ID: 2.1.3 Name: STAT-HIST

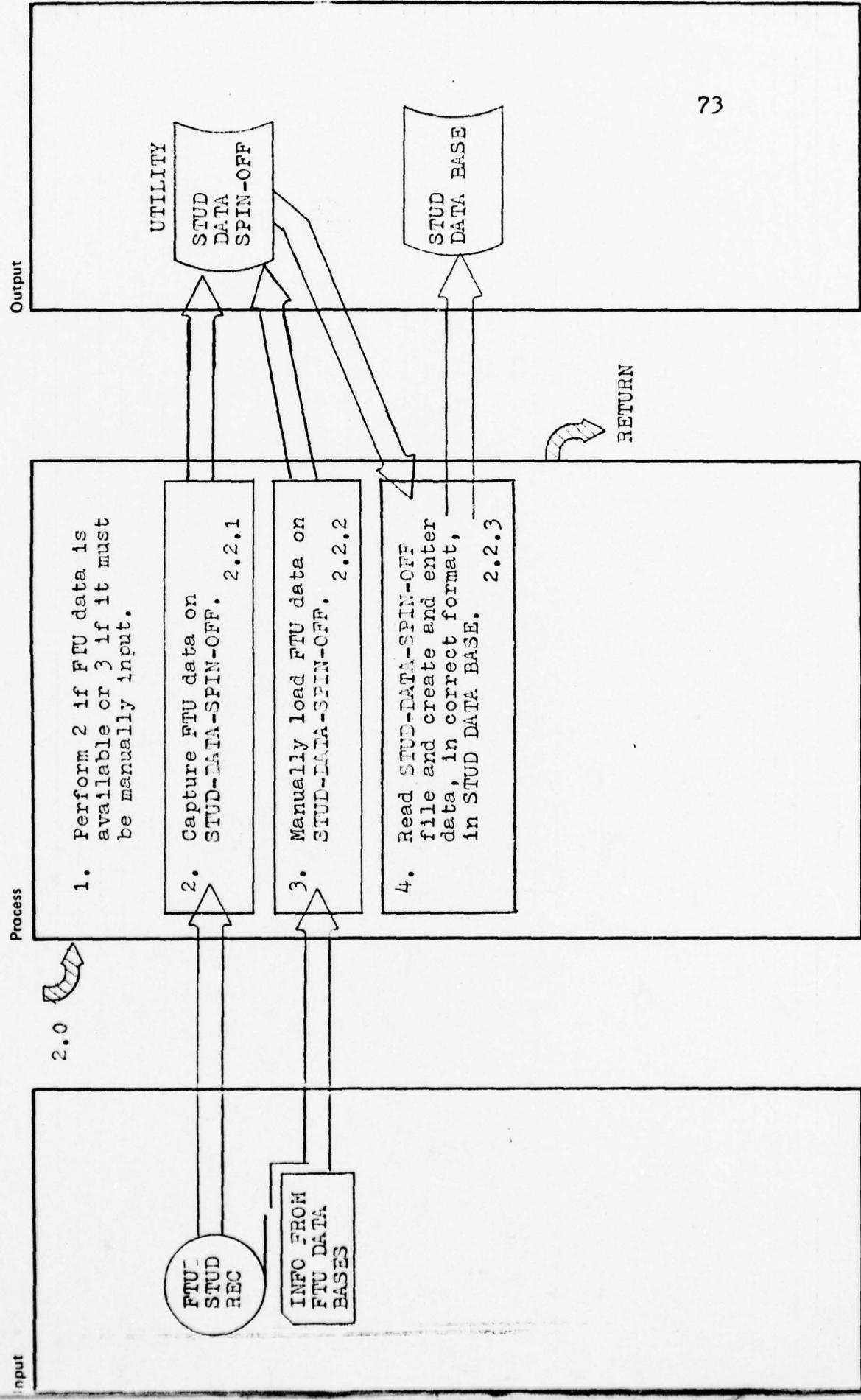
Date: 3/20/76 Page: 1 of 1
 Description: MAINTAIN STATISTICS HISTORY FILE



HIPo WORKSHEET

GX20-1970-0 U/M 025 *
Printed in U.S.A.

Author:	ROGER SIFRIT	System/Program:	SIS
Diagram ID:	2.0	Name:	LOAD-FTU-DATA
		Description:	LOAD FTU STUDENT DATA



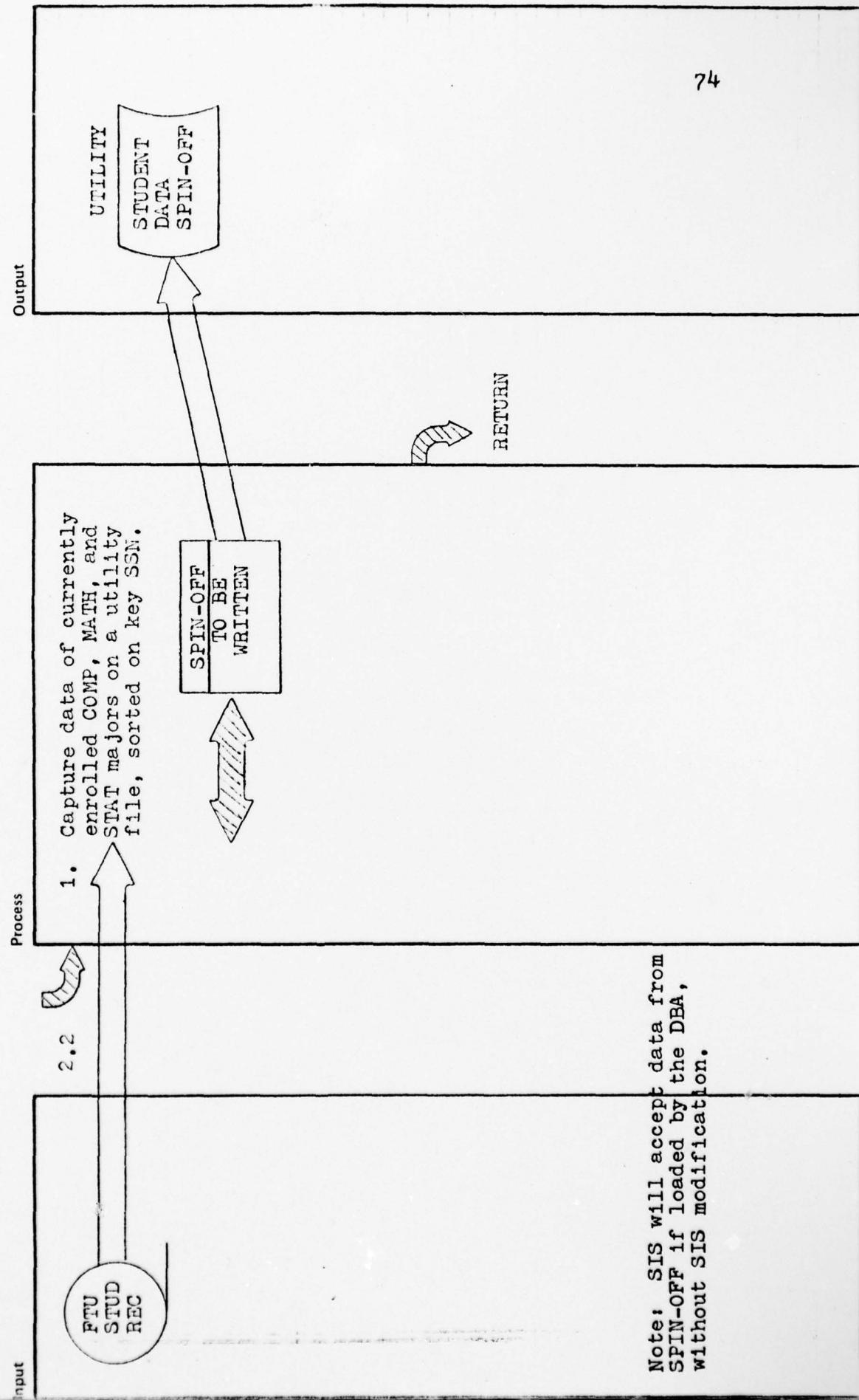
HIPo WORKSHEET

Author: ROGER SIFRIT System/Program: SIS
 Diagram ID: 2.2.1 Name: GET-SPIN-OFF

GX20-1970-0 U/M 025 *
 Printed in U.S.A.

Date: 3/6/76 Page: 1 of 1

Description: CA.PTURE FTU DATA ON SPIN-OFF FILE



Note: SIS will accept data from SPIN-OFF if loaded by the DBA, without SIS modification.

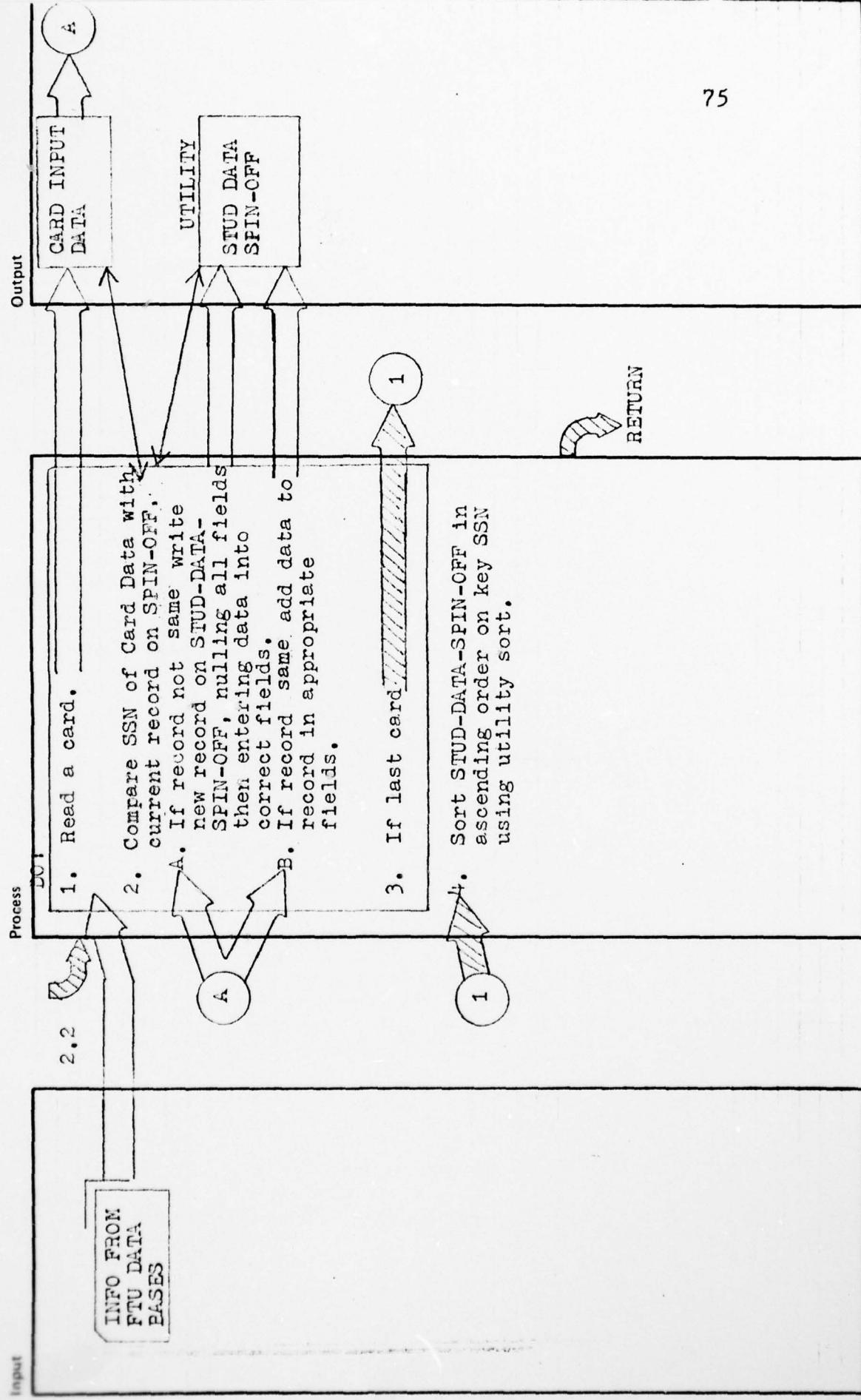
IBM HIPO WORKSHEET

Author: ROGER SIFRIT System/Program: SIS
 Diagram ID: 2.2.2 Name: LOAD-SPIN-OFF

GX20-1970-0 U/M 025
 Printed in U.S.A.

Date: 3/6/76 Page: 1 of 1

Description: MANUALLY LOAD FTU DATA ON SPIN-OFF



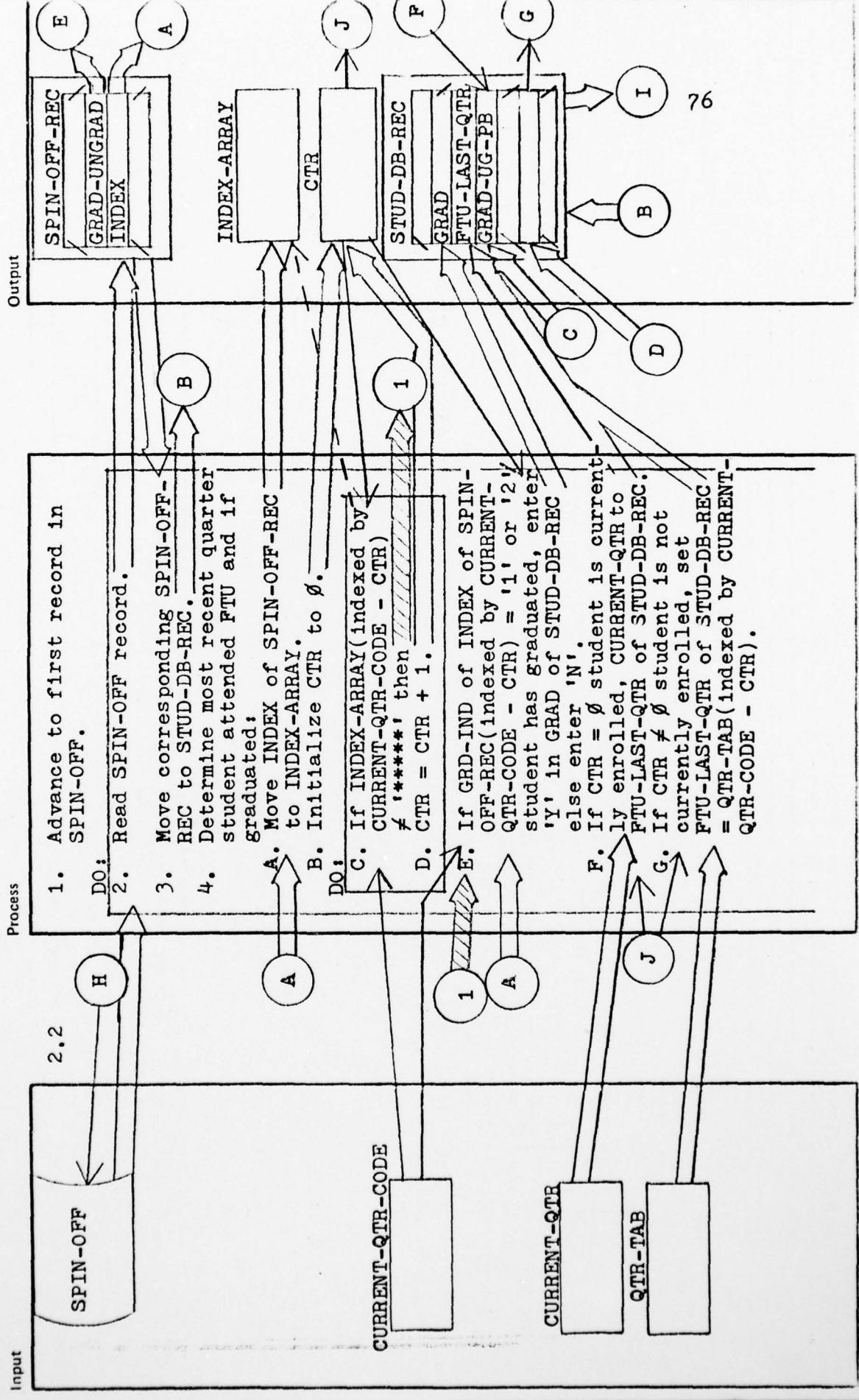
HPO WORKSHEET

Author: ROGER SIFRIT
 Diagram ID: 2.2.3

System/Program: SIS
 Name: LOAD-STUD-DB

GX20-1970-0 U/M 025
 Printed in U.S.A.

Date: 3/28/76 Page: 1 of 2
 Description: LOAD STUD-DATA-BASE FROM SPIN-OFF





HIPPO WORKSHEET

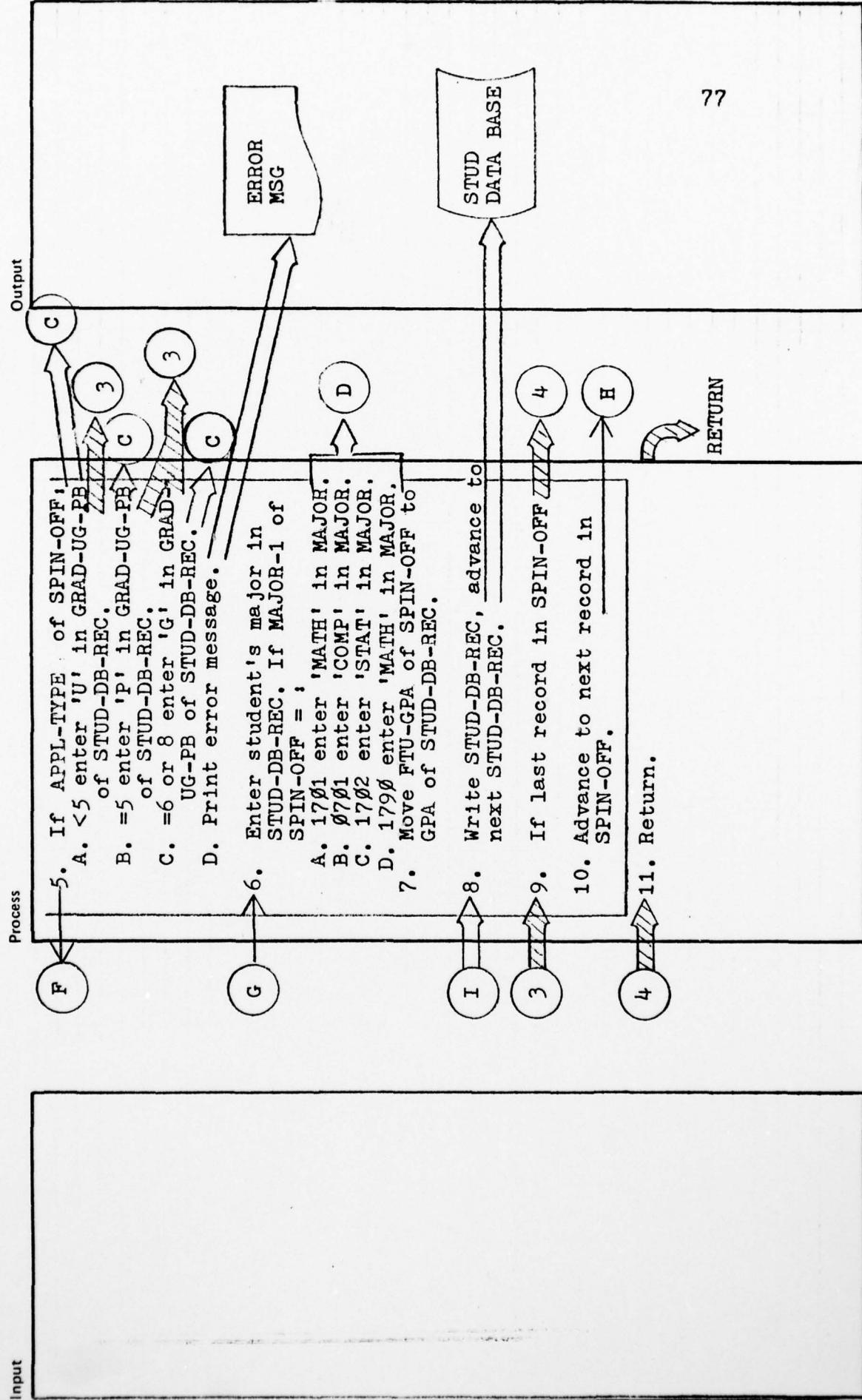
Author: ROGER SIFRIT Diagram ID: 2.2.3

— System/Program: SIS
LOAD-STUD-DB

GX20-1970-0 U/M 025 *
Printed in U.S.A.

Printed in U.S.A.

Description: LOAD STUD-DATA-BASE FROM SPIN-OFF



HPO WORKSHEET

Author: ROGER SIFRIT

System/Program: SIS

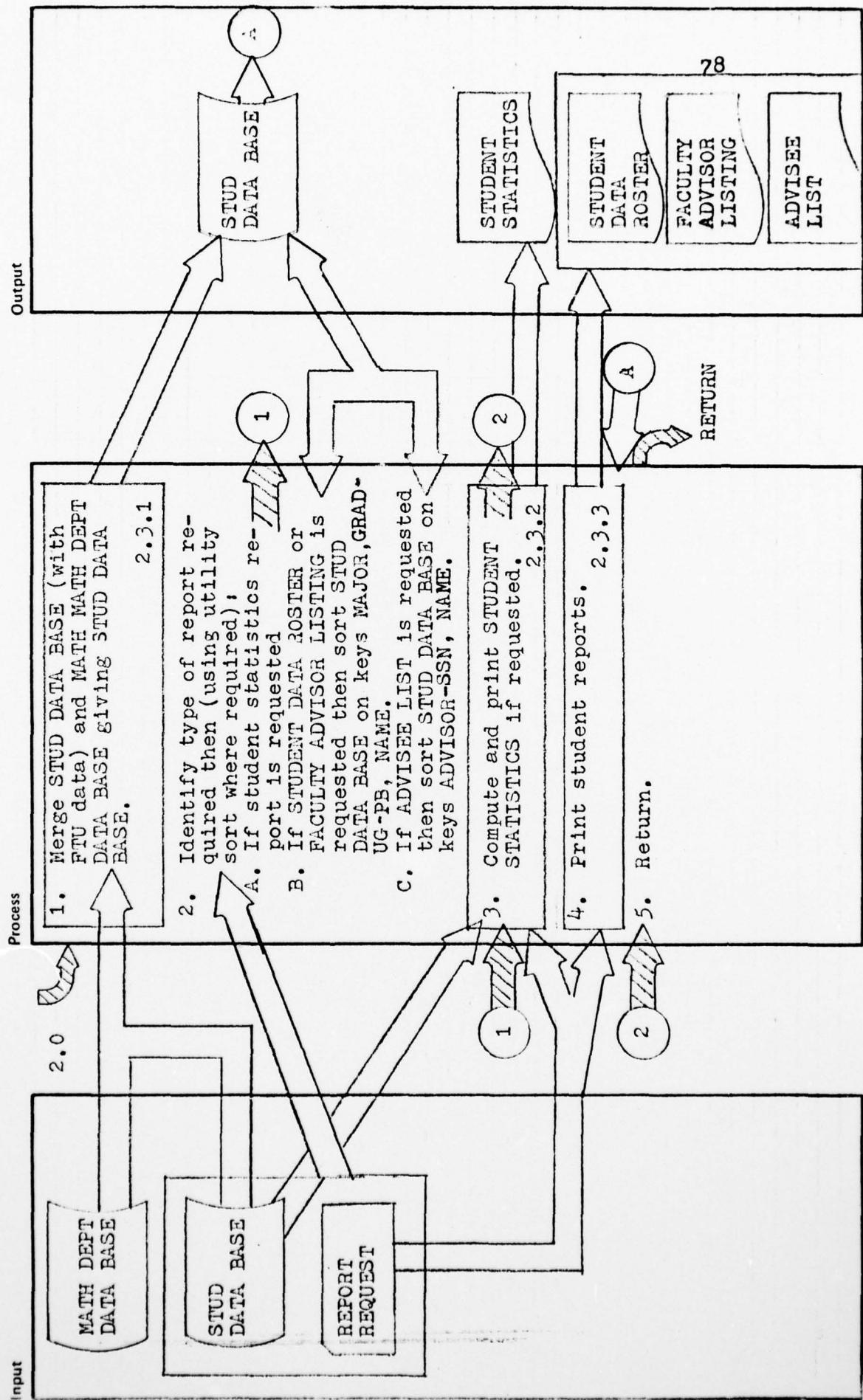
Diagram ID: 2.3

Name: GENERATE-REPORTS

Date: 3/6/76 Page: 1 of 1

Printed in U.S.A.

GX20-1970-0 U/M 025 *

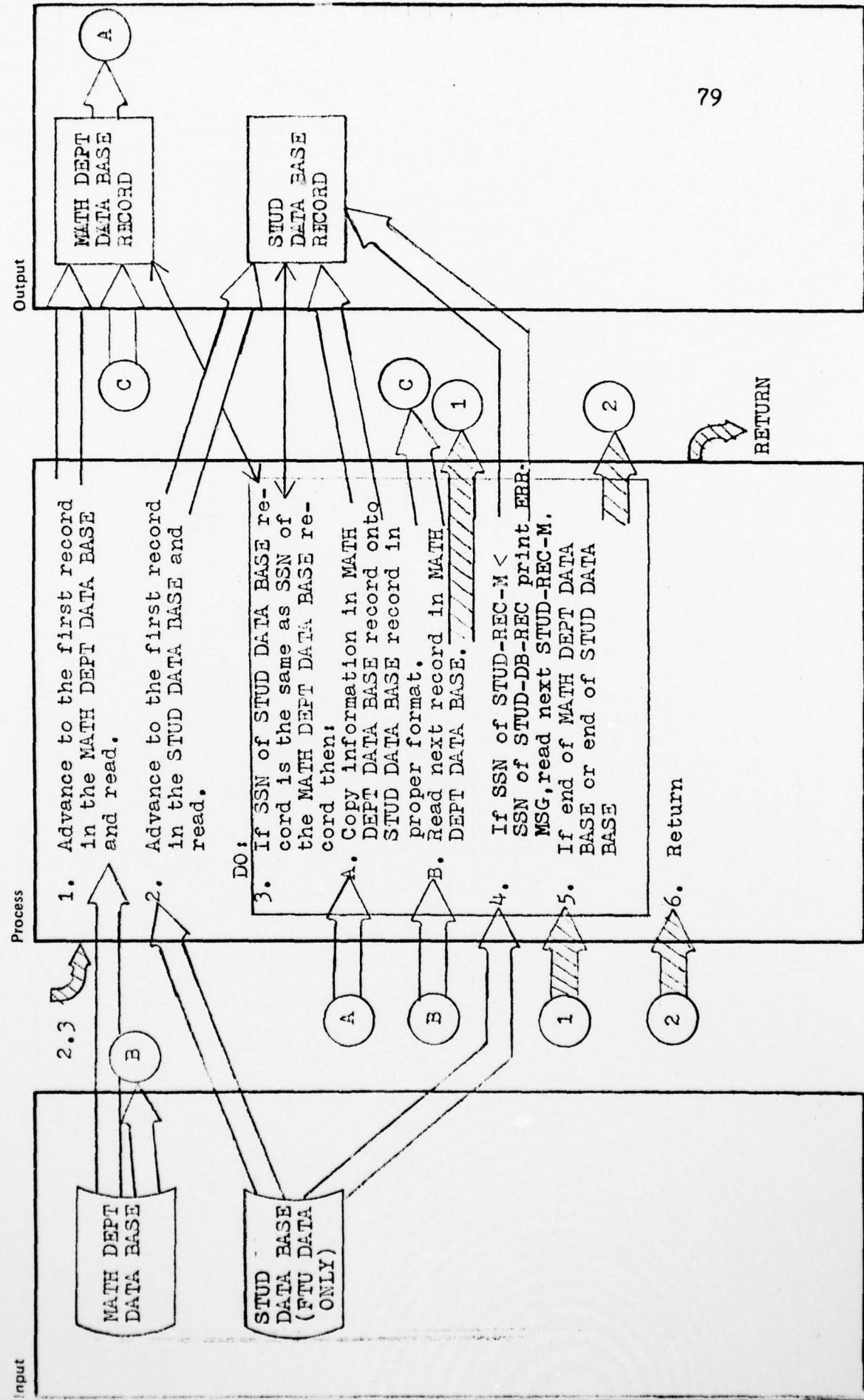


HIPPO WORKSHEET

GX20-1970-U/M 025 *
Printed in U.S.A.

Author: ROGER SIFRIT System/Program: SIS
 Diagram ID: 2.3.1 Name: MERGE-DATA

Date: 3/6/76 Page: 1 of 1
 Description: MERGE FTU AND MATH DATA

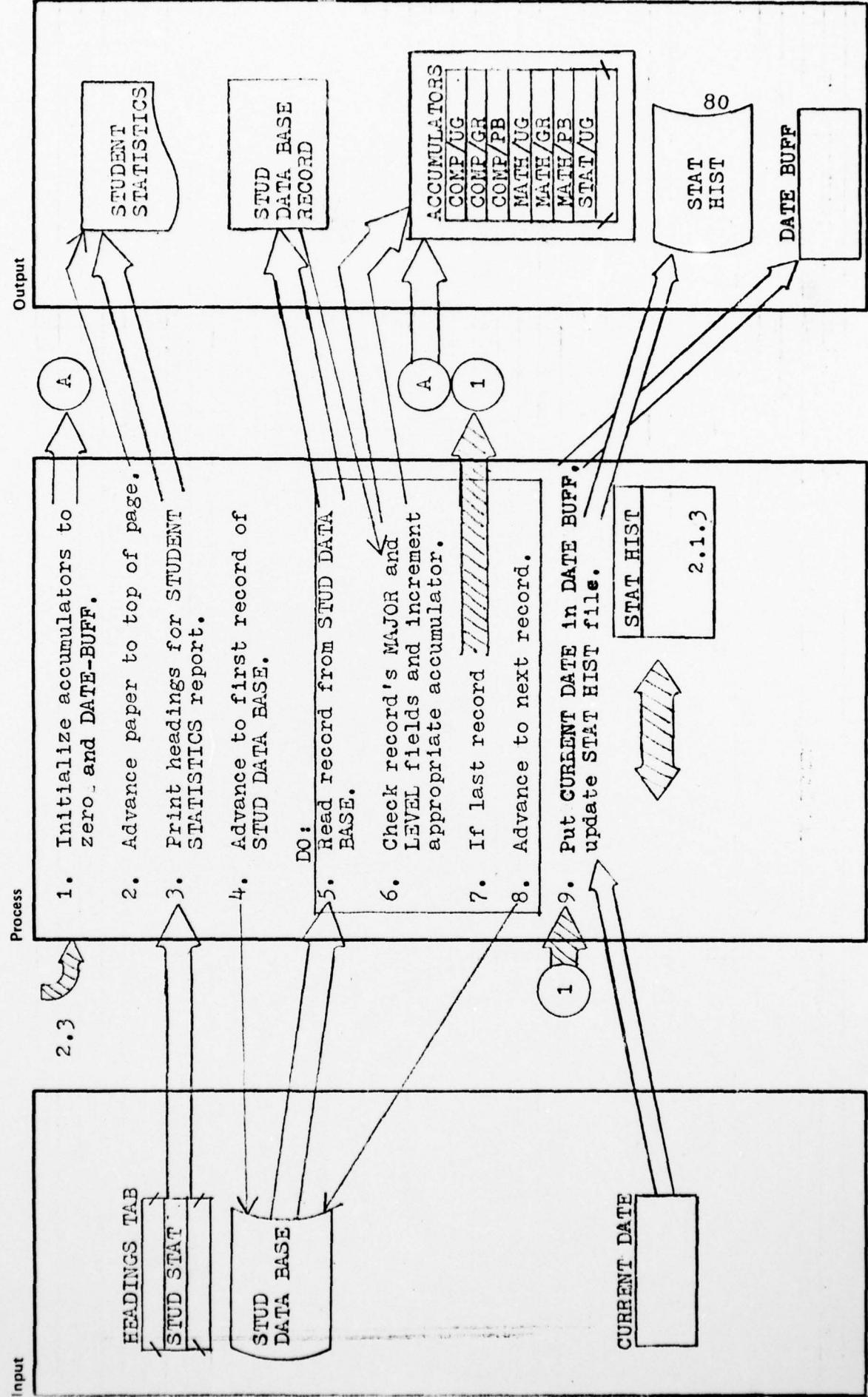


HIPo WORKSHEET

GX20-1970-0 U/M 025
Printed in U.S.A.

Author: ROGER SIFRIT System/Program: SIS
 Diagram ID: 2.3.2 Name: PRINT-STAT

Date: 3/6/76 Page: 1 of 2
 Description: COMPUTE AND PRINT STUDENT STAT



ACCUMULATORS
COMP/UG
COMP/GR
COMP/PB
MATH/UG
MATH/GR
MATH/PB
STAT/UG

CURRENT DATE
STAT HIST
DATE BUFF

STUDENT
STATISTICS

STUD
DATA BASE
RECORD

STAT
HIST
80

DATE BUFF

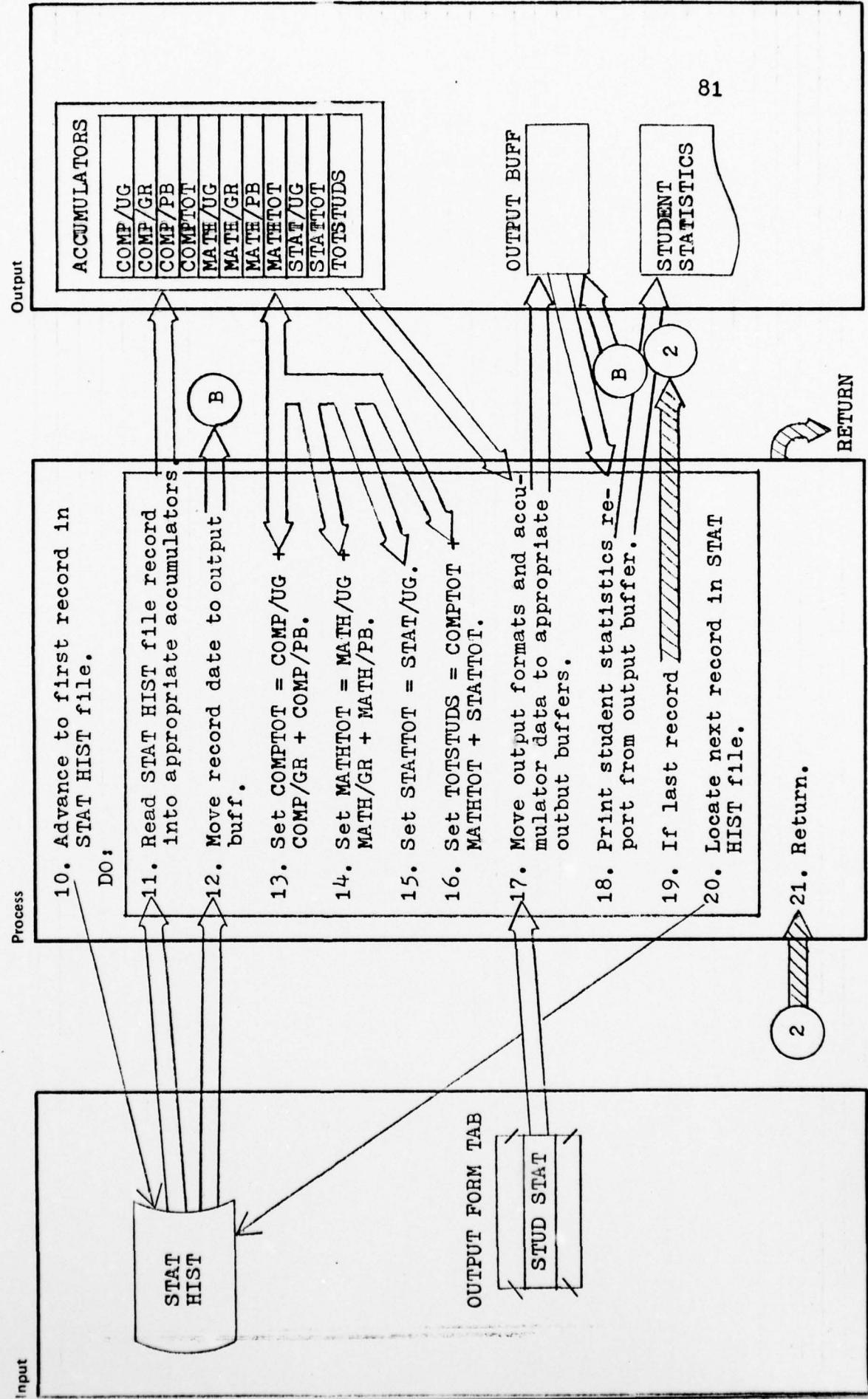
STAT HIST
2.1.3

HIPo WORKSHEET

GX20-1970-0 U/M 025 *
Printed in U.S.A.

Author: ROGER SIFRIT System/Program: SIS
 Diagram ID: 2.3.2 Name: PRINT-STAT

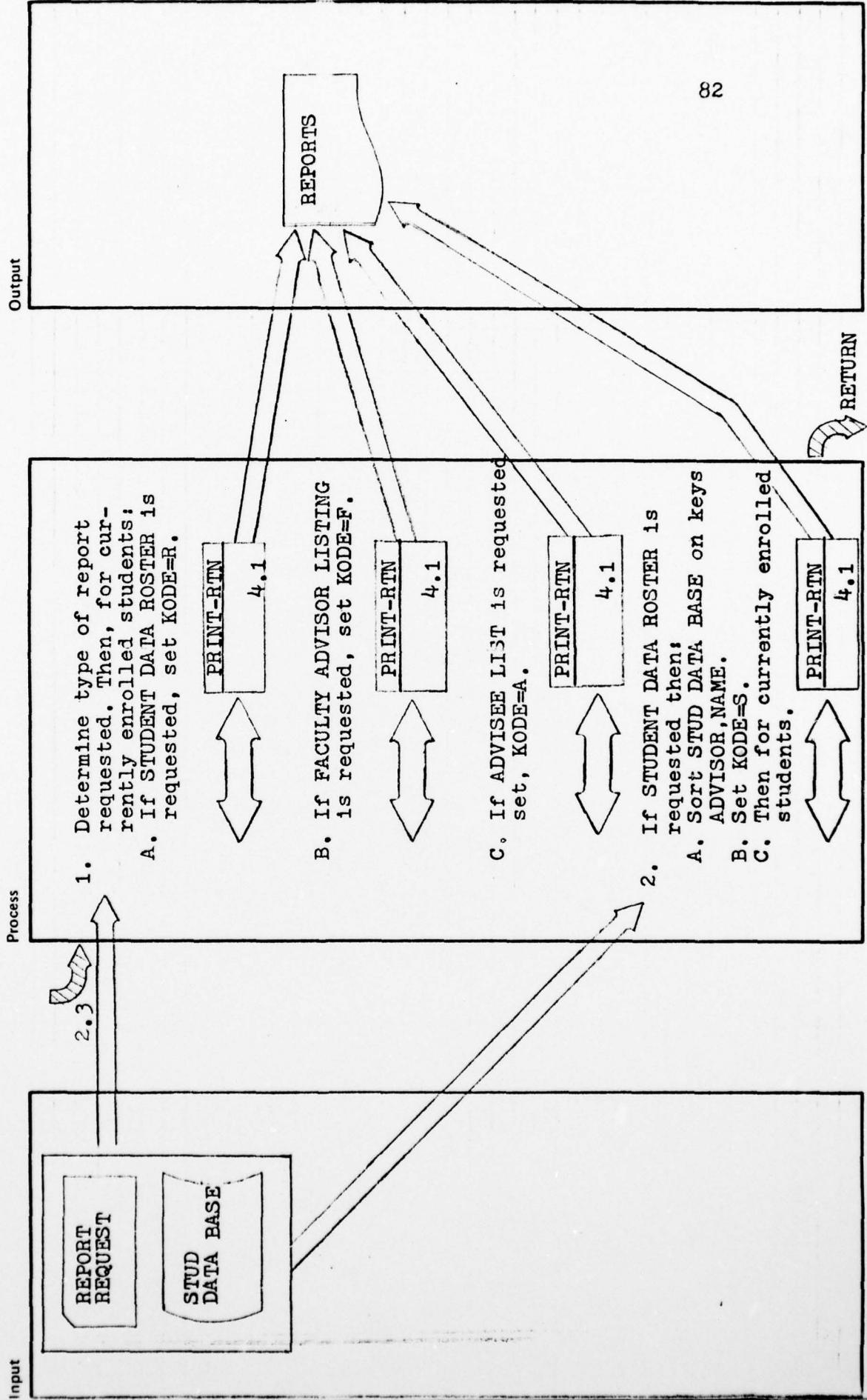
Date: 3/20/76 Page: 2 of 2
 Description: COMPUTE AND PRINT STUDENT STAT



HIPO WORKSHEET

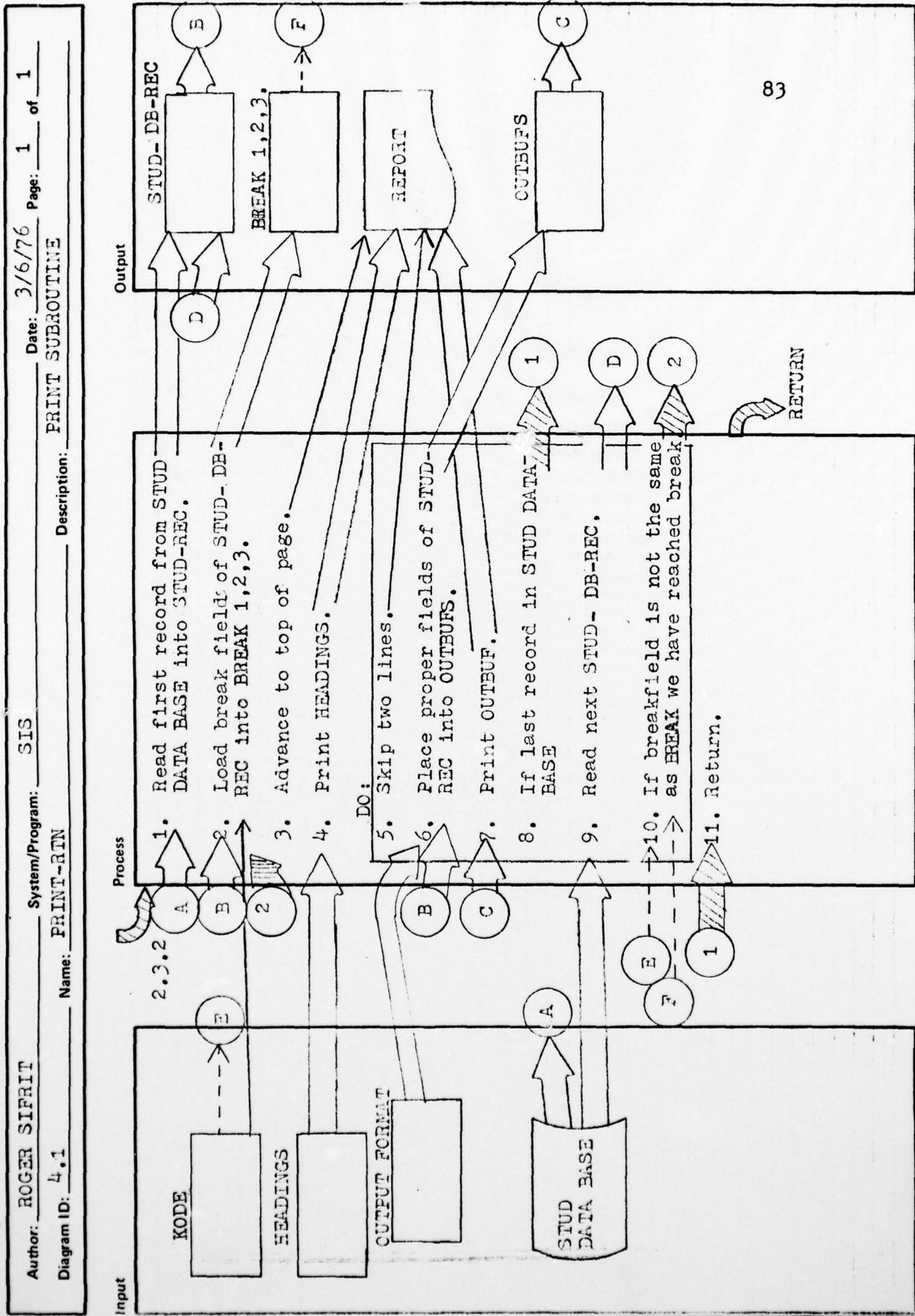
GX20-1970-0 U/M 025 *
Printed in U.S.A.

Author: ROGER SIFERIT System/Program: SIS
 Diagram ID: 2.3.3 Name: PRINT-REPT
 Description: PRINT STUD REPORTS



HIPo WORKSHEET

Author: ROGER SIFRIT System/Program: SIS
 Diagram ID: 4.1 Name: PRINT-RTN



Appendix E
SIS DECK LISTINGS

/*
LISTING OF DECK # 1 (STS RUN DECK)
INSERT DATA HERE
*/

```

//COMP69AP JOB (1770,3376,NCLZ,FTU,S,S) //ROGER SIFRIT//CLASS=H.
//*
/* JOBPARM PSS=N0•F=1410,K=61
   EXEC COBUCLG
   IDENTIFICATION DIVISION.
   PROGRAM-ID. CREATEMATH-DEPT-STUD-DR.
   ENVIRONMENT DIVISION.
   INPUT-OUTPUT SECTION.
   FILE-CONTROL MATH-DEPT-STUD-DB ASSIGN TO DA-3330-S-DISKMDR.
   DATA DIVISION.
   FILE SECTION.
   FD MATH-DEPT-STUD-DB LABEL RECORD IS STANDARD RECORDING N
   DATA-RECORD IS STUD-REC-M.
   01 STUD-REC-M.
   02 ATTEND-DATA PIC X(100).
   02 MBR-DATA PIC X(70).
   02 SSN PIC 9(09).
   02 ADVISOR-NAME PIC X(18).
   02 ADVISOR-SSN PIC 9(09).

PROCEDURE DIVISION.
OPEN OUTPUT MATH-DEPT-STUD-DR.
MOVE SPACES TO STUD-REC-M.
MOVE ZEROS TO SSN OF STUD-REC-M.
WRITE STUD-REC-M.
CLOSE MATH-DEPT-STUD-DB.
STOP RUN.

//GO.DISKMDR DD DSNE=FTU,OU=P1770,MDB.
SPACE=(TRK,(1,1)),
DISP=(NEW,KEEP,CATLG),
UNIT=DISK,VOL=SER=F7UPK1
//*/
```

LISTING OF DECK # 3
(FOR CREATION OF MATH-DEPT-STUD-DB FILE)

```

//COMP699P JOB (1770•3376•NCLZ,FTU,S,5) •'ROGER SIFRIT',CLASS=B, X
// EXEC CROUCLG
// IDENTIFICATION DIVISION
// PROGRAM-ID• CREATESTAT-HIST-DB.
// ENVIRONMENT DIVISION.
// INPUT-OUTPUT SECTION.
// FILE-CONTROL.
// SELECT STAT-HIST-DB ASSIGN TO DA-3330-S-HISTDB.
// DATA DIVISION.
// FILE SECTION.
// FD STAT-HIST-DB LABEL RECORD IS STANDARD RECORDING MODE IS F
// DATA RECORD IS STAT-REC.
01 STAT-REC.
    03 QTR          PIC 9(03).
    03 COMP-UG      PIC 9(04).
    03 COMP-GG      PIC 9(04).
    03 COMP-PA      PIC 9(04).
    03 MATH-UG      PIC 9(04).
    03 MATH-GG      PIC 9(04).
    03 MATH-PA      PIC 9(04).
    03 STAT-UG      PIC 9(04).
PROCEDURE DIVISION.
OPEN OUTPUT STAT-HIST-DB.
MOVE ZEROS TO STAT-REC.
WRITE STAT-REC.
CLOSE STAT-HIST-DB.
STOP RUN DD DSN=FTU•OU•P1770•HDB,
DISP=(NEW•KEFP•CATLG),
SPACE=(TRK•(1•1)•
UNIT=DISK,VOL=SER=FTUPK1
//*
//
```

LISTING OF DECK # 4

(FOR CREATION OF STAT-HIST-DB FILE)

LISTING OF DECK #

5a

SPIN-OFF TEST DATA			
111111111111PETERSON	OSCAR	417027114000M1	
211111111199 BLUES STREET	OVIDA	FL998873057418523	
311111111111 JAZZ BLVD	NEW ORLEANS	LA55555	
4111111111 0000 0003 0408 0912 1315 1620 2125 2629 3036*****			
4111223333**** 0003 0408 0912 1315 1620 2125 2629 3036*****			
1111223333JORGENSEN	OSCAR	617907113991M2	
11234567899JONES	JOHN P	617907113888M1	
41234567899**** 0003 0408 0912 1315 1620 2125 2629 3036*****			
212345678944 SHIPWRECK WAY	TAMDA	FL325563057747532	
312345678925 SHORE DRIVE	SHEEPSHEAD RAY	NY11112	
1153283376SIFRIT	ROGER WILLIAM	607017024000M2	
21532833761298 ROYAL BTRKDALE ROCKLEDGE		FL329553056310184	
3153283376421 FORTH STREET	FT LAUDERDLE	FL33012	
4153283376 0000 0005 0609 1013 1417 182112225*****			
4222222222**** 0003 0408 0912 1315 1620 2125 2629 3036*****			
1222222222MANTX	KARL	317027012444M1	
1222334444WASHINGTON	GEORGE C	617907113998M1	
4222334444**** 0003 0408 0912 1315 1620 2125 2629 3036*****			
2222334444111 WASHINGTON AVE	WASHINGTON	DC767678007661976	
32223344441600 PENN AVE	WASHINGTON	DC76776	
4333333333**** 0003 0408 0912 1315 1620 2125 2629 3036*****			
1333333333SMITH	BETTY JONES	317027113225F1	
233333333312 SHORT STREET	FLAG CITY	FL333543056667856	
33333333342 TEMPLE AVENUE	TEMPLE	TX68953	
4333445555**** 0003 0408 0912 1315 1620 2125 2629 3036*****			
1333445555ZEWCOWSKI	PETER ADRIAN	517907113555M2	
244444444466 APPLE WAY	APPLE OF EYE	FL777883054442563	
244444444466 APPLE WAY	APPLE OF EYE	FL77788	
4444444444 0000 0003 0408**** 1315 1620**** 2629 3036*****			
1444444444APPLETON	MARY CARLTON	407017112888F1	
4444556666**** 0003 0408 0912 1315 1620 2125 2629 3036*****			
1444556666SHOEACHER	WILLIAM B	517907113885M2	
4555555555**** 0003 0408***** 1620**** 2629 3036*****			
15555555557IMMERMAN	SETH ARNOLD	407017112333M1	
4555667777**** 0003 0408 0912 1315 1620 2125 2629 3036*****			
1555667777FU	LFE SHU	517907112999M1	
4666666666**** 0003 0408 0912 1315 1620 2125 2629 3036*****			
1666666666BROWN	ADOLPH RONALD	407017112555M1	
1666778888CONROY	MARY ELLEN	507017113999F1	
3666778888112 JAMES STREET	ORLANDO	FL55542	
2666778888112 JAMES STREET	ORLANDO	FL555423056689638	
4666778888**** 0003 0408 0912 1315 1620 2125 2629 3036*****			
4777777777**** 0003 0408 0912 1315 1620 2125 2629 3036*****			
1777777777BAXTER	JOHN DENVER	607017113888M2	
1777889999BAXTER	JIMMY BUD	507017113985M1	
377788999914 BRENT ROAD	CHICAGO	IL32564	
4777889999***** 0912 1315 1620 2125 2629 3036*****			
2777889999PEN 1	BUS STOP	FL22233056669874	
4888888888**** 0003 0408 0912 1315 1621 2125 2629 3036*****			
1888888888ROSEY	SAMUAL	607017113995M2	
2888888888RFD 999	ORLANDO	FL324563056668745	
3888888888RFD 999	ORLANDO	FL32456	
4888999999***** 2125 2629 3036*****			
1888999999REYNOLDS	BURTRAND R	507017112555M1	
288899999953 TOBACCO ROAD	ORLANDO	FL555443054442536	
388899999966 CIGAR WAY	HICK TOWN	CA99999	
299999999955 FIFTH STREET	ORLANDO	FL123453053334444	
19999999998ROWN	JOSEPH DONALD	417017013222M1	
399999999966 SIXTH STREET	DALLAS	TX99999	
4999999999***** 0002 0306 0406 07102114*****			

AD-A052 628

FLORIDA TECHNOLOGICAL UNIV ORLANDO
DEMIS, AN INFORMATION SYSTEM TO SUPPORT EDUCATIONAL MANAGEMENT --ETC(U)
JUN 76 R W SIFRIT

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2 OF 2

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1

2

00002 IDENTIFICATION DIVISION.
00003 PROGRAM-ID. STUDENT INFORMATION SYSTEM.
00004 AUTHOR. ROGER W SIFRIT.
00005 INSTALLATION. FTU.
00006 DATE-WRITTEN. MARCH 31, 1976.
00007 DATE-COMPILED. JUN 3, 1976.
00008 SECURITY. THE REPORTS PRODUCED BY THIS PROGRAM CONTAIN
00009 INFORMATION WHICH IS PERSONAL IN NATURE.
00010 REMARKS.

00012 ENVIRONMENT DIVISION.
00013 CONFIGURATION SECTION.
00014 SOURCE-COMPUTER. IBM-360-65.
00015 OBJECT-COMPUTER. IBM-360-65.
00016 TINPUT-OUTPUT SECTION.
00017 FILE-CONTROL.
00018 SELECT CARD-IN ASSIGN TO UT-S-READER.
00019 SELECT PRINT-FILE ASSIGN TO UT-S-PROUT.
00020 SELECT MATH-CHANGE ASSIGN TO UT-S-DISKCG.
00021 SELECT SPIN-OFF ASSIGN TO DA-3330-S-DISKSP0.
00022 SELECT STUD-DATA-BASE ASSIGN TO DA-3330-S-DISKSDB.
00023 SELECT STAT-HIST-DB ASSIGN TO DA-3330-S-HISTDR.
00024 SELECT MATH-DEPT-STUD-DB ASSIGN TO DA-3330-S-DISKMDR.
00025 SELECT SORT-WORK-SDB ASSIGN TO DA-3330-S-SORTWK01.
00026 SELECT SORT-WORK-HDR ASSIGN TO DA-3330-S-SORTWK01.
00027 SELECT INPUT-SORT-FILE ASSIGN TO DA-3330-S-SORTWK01.
00028 SELECT SORT-WORK-SP0 ASSIGN TO DA-3330-S-SORTWK01.
00029 SELECT MATH-REORG ASSIGN TO DA-3330-S-DISKMR.
00030 SELECT HIST-REORG ASSIGN TO DA-3330-S-DISKHR.
00031 I-O-CONTROL.
00032 SAME SORT AREA FOR SORT-WORK-SDB SORT-WORK-HDR SORT-WORK-SP0
00033 INPUT-SORT-FILE.

00035 DATA DIVISION.

00038 FILE SECTION.

00040 FD CARD-IN LABEL RECORD IS OMITTED RECORDING MODE IS F RECORD
 00041 CONTAINS 80 CHARACTERS
 00042 DATA RECORDS ARE CODE-CHECK,
 00043 FTU-ATTEND-Q, ALTER-STAT-HIST-H, ASSN-MBR-M, MRR-DELETE-X,
 00044 INDEX-4, BASIC-DATA-1, PARENTS-ADDRESS-3, STUD-ADDRESS-2,
 00045 FTU-ATTEND-DELETE-Z, YEAR-AND-QUARTER-Y, ADVISOR-V.
 00046 01 CODE-CHECK.
 00047 02 COOD PIC X(01).
 00048 02 REST PIC X(79).
 00049 01 FTU-ATTEND-Q.
 00050 02 FILLER PIC X(01).
 00051 02 SSN PIC 9(09).
 00052 02 ATTEND-DATA PIC X(70).
 00053 01 ALTER-STAT-HIST-H.
 00054 02 FILLER PIC X(01).
 00055 02 HIST-DATA.
 00056 03 QTR-H PIC 9(03).
 00057 03 COMP-UG PIC 9(04).
 00058 03 COMP-GR PIC 9(04).
 00059 03 COMP-PB PIC 9(04).
 00060 03 MATH-UG PIC 9(04).
 00061 03 MATH-GR PIC 9(04).
 00062 03 MATH-PB PIC 9(04).
 00063 03 STAT-UG PIC 9(04).
 00064 02 FILLER-H PIC X(48).
 00065 01 ASSN-MBR-M.
 00066 02 FILLER PIC X(01).
 00067 02 SSN PIC 9(09).
 00068 02 MBR-DATA PIC X(70).
 00069 01 MRR-DELETE-X.
 00070 02 FILLER PIC X(01).
 00071 02 SSN PIC 9(09).
 00072 02 ASSN-NAME PIC X(70).
 00073 01 INDEX-4.
 00074 02 FILLER PIC X(01).
 00075 02 SSN PIC 9(09).
 00076 02 INDEX-DATA PIC X(70).
 00077 01 BASIC-DATA-1.
 00078 02 FILLER PIC X(01).
 00079 02 SSN PIC 9(09).
 00080 02 LAST-NAME PIC X(18).
 00081 02 FRST-MDLF-NAME PIC X(30).
 00082 02 APPL-TYPE PIC 9(01).
 00083 02 MAJOR-1 PIC 9(04).
 00084 02 FTU-SUMMARY.
 00085 05 FTU-LAST-QTR PIC 9(03).
 00086 05 FTU-GPA PIC 9V999.
 00087 02 SEX PIC X(01).
 00088 02 MARITAL-STATUS PIC 9(01).
 00089 02 FILLER PIC X(08).

00090	01	PARENTS-ADDRESS-3.	
00091	02	FILLER	PIC X(01).
00092	02	SSN	PIC 9(09).
00093	02	KIN-STREET	PIC X(20).
00094	02	KIN-CITY	PIC X(20).
00095	02	KIN-STATE	PIC X(02).
00096	02	KIN-ZIP	PIC 9(05).
00097	02	FILLER	PIC X(23).
00098	01	STUD-ADDRESS-2.	
00099	02	FILLER	PIC X(01).
00100	02	SSN	PIC 9(09).
00101	02	HOME-STREET	PIC X(20).
00102	02	HOME-CITY	PIC X(20).
00103	02	HOME-STATE	PIC X(02).
00104	02	HOME-ZIP	PIC 9(05).
00105	02	HOME-PHONE	PIC 9(10).
00106	02	FILLER	PIC X(13).
00107	01	FTU-ATTEND-DELETE-Z.	
00108	02	FILLER	PIC X(01).
00109	02	SSN	PIC 9(09).
00110	02	ATTEND-DATA	PIC X(04).
00111	02	FILLER	PIC X(66).
00112	01	YEAR-AND-QUARTER-Y.	
00113	02	FILLER	PIC X(01).
00114	02	DATA-Y.	
00115	05	SCHOOL-YEAR	PIC 9(02).
00116	05	SCHOOL-QUARTER	PIC 9(01).
00117	02	FILLER-Y	PIC X(76).
00118	01	ADVISOR-V.	
00119	02	FILLER	PIC X(01).
00120	02	SSN	PIC 9(09).
00121	02	ADVISOR-NAME	PIC X(18).
00122	02	ADVISOR-SSN	PIC 9(09).
00123	02	FILLER	PIC X(43).
00125	FD	MATH-CHANGE LABEL RECORD IS STANDARD RECORDING MODE F	
00126		DATA RECORDS ARE CODE-CHECK-W, FTU-ATTEND-W, ASSN-MBR-W,	
00127		MBR-DELETE-W, FTU-ATTEND-DELETE-W, ADVISOR-W,	
00128		MATH-CHANGE-REC.	
00129	01	CODE-CHECK-W.	
00130	02	COWD	PIC X(01).
00131	02	REST-W	PIC X(79).
00132	01	FTU-ATTEND-W.	
00133	02	FILLER	PIC X(01).
00134	02	SSN	PIC 9(09).
00135	02	ATTEND-DATA	PIC X(70).
00136	01	ASSN-MBR-W.	
00137	02	FILLER	PIC X(01).
00138	02	SSN	PIC 9(09).
00139	02	MAR-DATA	PIC X(70).
00140	01	MBR-DELETE-W.	
00141	02	FILLER	PIC X(01).
00142	02	SSN	PIC 9(09).
00143	02	ASSN-NAME	PIC X(70).
00144	01	FTU-ATTEND-DELETE-W.	
00145	02	FILLER	PIC X(01).

00146	02 SSN	PIC 9(09).
00147	02 ATTEND-DATA	PIC X(04).
00148	02 FILLER	PIC X(66).
00149	01 ADVISOR-W.	
00150	02 FILLER	PIC X(01).
00151	02 SSN	PIC 9(09).
00152	02 ADVISOR-NAME	PIC X(18).
00153	02 ADVISOR-SSN	PIC 9(09).
00154	02 FILLER	PIC X(43).
00155	01 MATH-CHANGE-REC.	
00156	05 FILLER	PIC X(01).
00157	05 SSN	PIC 9(09).
00158	05 FILLER	PIC X(70).
00160	FD STUD-DATA-BASE LABEL RECORD IS STANDARD	RECORDING MODE IS F
00161	DATA RECORD IS STUD-DB-REC.	
00162	01 STUD-DB-REC.	
00163	02 LAST-NAME	PIC X(18).
00164	02 FRST-MDLE-NAME	PIC X(30).
00165	02 SSN	PIC 9(09).
00166	02 GRAD-UG-PB	PIC X(01).
00167	02 MAJOR	PIC X(04).
00168	02 GPA	PIC 9V999.
00169	02 SEX	PIC X(01).
00170	02 GRAD	PIC X(01).
00171	02 FTU-LAST-QTR	PIC 9(03).
00172	02 HOME-STREET	PIC X(20).
00173	02 HOME-CITY	PIC X(20).
00174	02 HOME-STATE	PIC X(02).
00175	02 HOME-ZIP	PIC X(05).
00176	02 HOME-PHONE	PIC X(10).
00177	02 KIN-STREET	PIC X(20).
00178	02 KIN-CITY	PIC X(20).
00179	02 KIN-STATE	PIC X(02).
00180	02 KIN-ZIP	PIC X(05).
00181	02 MARITAL-STATUS	PIC X(01).
00182	02 ATTEND-DATA	PIC X(70).
00183	02 MRR-DATA	PIC X(70).
00184	02 ADVISOR-NAME	PIC X(18).
00185	02 ADVISOR-SSN	PIC 9(09).
00187	FD PRINT-FILE LABEL RECORDS OMITTED	DATA RECORD IS PRINT-LINE.
00188	01 PRINT-LTNE	PIC X(133).
00190	FD SPIN-OFF LABEL RECORD IS STANDARD	RECORDING MODE IS F
00191	DATA RECORD IS SPIN-OFF-REC.	
00192	01 SPIN-OFF-REC.	
00193	02 LAST-NAME	PIC X(18).
00194	02 FRST-MDLE-NAME	PIC X(30).
00195	02 SSN	PIC 9(09).
00196	02 APPL-TYPE	PIC 9(01).
00197	02 MAJOR-1	PIC 9(04).
00198	02 FTU-SUMMARY.	
00199	05 FTU-LAST-QTR	PIC 9(03).

00200		05 FTU-GPA	PIC 9V999.
00201		02 SEX	PIC X(01).
00202		02 INDX	PIC X(200).
00203	*	05 GRD-IND	PIC X(01).
00204	*	05 START-SUB	PIC X(02).
00205	*	05 END-SUB	PIC X(02).
00206		02 HOME-STREET	PIC X(20).
00207		02 HOME-CITY	PIC X(20).
00208		02 HOME-STATE	PIC X(02).
00209		02 HOME-ZIP	PIC X(05).
00210		02 HOME-PHONE	PIC X(10).
00211		02 KIN-STREET	PIC X(20).
00212		02 KIN-CITY	PIC X(20).
00213		02 KIN-STATE	PIC X(02).
00214		02 KIN-ZIP	PIC 9(05).
00215		02 MARITAL-STATUS	PIC X(01).

00217 FD STAT-HIST-DR LABEL RECORD IS STANDARD RECORDING MODE IS F
 00218 DATA RECORD IS STAT-REC.
 01 STAT-REC.

00220	03 QTR	PIC 9(03).
00221	03 COMP-UG	PIC 9(04).
00222	03 COMP-GR	PIC 9(04).
00223	03 COMP-PB	PIC 9(04).
00224	03 MATH-UG	PIC 9(04).
00225	03 MATH-GR	PIC 9(04).
00226	03 MATH-PB	PIC 9(04).
00227	03 STAT-UG	PIC 9(04).

00229 SD SORT-WORK-SDR RECORDING MODE IS F DATA RECORD IS
 00230 SORT-SDR-RFC.
 00231 01 SORT-SDR-REC.

00232	02 LAST-NAME	PIC X(18).
00233	02 FRST-MDLE-NAME	PIC X(30).
00234	02 SSN	PIC 9(09).
00235	02 GRAD-UG-PB	PIC X(01).
00236	02 MAJOR	PIC X(04).
00237	02 FTU-GPA	PIC 9V999.
00238	02 SEX	PIC X(01).
00239	02 GRAD	PIC X(01).
00240	02 FTU-LAST-QTR	PIC 9(03).
00241	02 HOME-STREET	PIC X(20).
00242	02 HOME-CITY	PIC X(20).
00243	02 HOME-STATE	PIC X(02).
00244	02 HOME-ZIP	PIC X(05).
00245	02 HOME-PHONE	PIC X(10).
00246	02 KIN-STREET	PIC X(20).
00247	02 KIN-CITY	PIC X(20).
00248	02 KIN-STATE	PIC X(02).
00249	02 KIN-ZIP	PIC X(05).
00250	02 MARITAL-STATUS	PIC X(01).
00251	02 ATTEND-DATA	PIC X(70).
00252	02 MBR-DATA	PIC X(18).
00253	02 ADVISOR-NAME	PIC X(18).
00254	02 ADVISOR-SSN	PIC 9(09).

00256 FD MATH-DEPT-STUD-DB LABEL RECORD IS STANDARD RECORDING MODE F
 00257 DATA RECORD IS STUD-REC-M.
 00258 01 STUD-REC-M.
 00259 02 ATTEND-DATA PIC X(100).
 00260 02 MBR-DATA PIC X(70).
 00261 02 SSN PIC 9(09).
 00262 02 ADVISOR-NAME PIC X(18).
 00263 02 ADVISOR-SSN PIC 9(09).
 00265 FD HIST-REORG LABEL RECORD IS STANDARD DATA RECORD IS
 00266 HIST-REORG-REC.
 00267 01 HIST-REORG-REC.
 00268 03 QTR PIC 9(03).
 00269 03 COMP-UG PIC 9(04).
 00270 03 COMP-GR PIC 9(04).
 00271 03 COMP-PB PIC 9(04).
 00272 03 MATH-UG PIC 9(04).
 00273 03 MATH-GR PIC 9(04).
 00274 03 MATH-PB PIC 9(04).
 00275 03 STAT-UG PIC 9(04).
 00277 SD INPUT-SORT-FILE RECORDING MODE F DATA RECORD IS
 00278 INPUT-SORT.
 00279 01 INPUT-SORT:
 00280 05 FILLER PIC X(01).
 00281 05 SSN PIC 9(09).
 00282 05 FILLER PIC X(70).
 00284 SD SORT-WORK-HDB RECORDING MODE F DATA RECORD IS
 00285 SORT-HDB-REC.
 00286 01 SORT-HDB-REC.
 00287 03 QTR PIC 9(03).
 00288 03 COMP-UG PIC 9(04).
 00289 03 COMP-GR PIC 9(04).
 00290 03 COMP-PB PIC 9(04).
 00291 03 MATH-UG PIC 9(04).
 00292 03 MATH-GR PIC 9(04).
 00293 03 MATH-PB PIC 9(04).
 00294 03 STAT-UG PIC 9(04).
 00296 SD SORT-WORK-SPO RECORDING MODE IS F DATA RECORD IS
 00297 SORT-SPO-REC.
 00298 01 SORT-SPO-REC.
 00299 02 LAST-NAME PIC X(18).
 00300 02 FRST-MDLE-NAME PIC X(30).
 00301 02 SSN PIC 9(09).
 00302 02 APPL-TYPE PIC 9(01).
 00303 02 MAJOR-I PIC 9(04).
 00304 02 FTU-SUMMARY.
 00305 05 FTU-LAST-QTR PIC 9(03).
 00306 05 FTU-GPA PIC 9V999.

00307	02 SEX	PIC X(01).
00308	02 INDX	PIC X(200).
00309	* 05 GRD-IND	PIC X(01).
00310	* 05 START-SUB	PIC X(02).
00311	* 05 END-SUB	PIC X(02).
00312	02 HOME-STREET	PIC X(20).
00313	02 HOME-CITY	PIC X(20).
00314	02 HOME-STATE	PIC X(02).
00315	02 HOME-ZIP	PIC 9(05).
00316	02 HOME-PHONE	PIC 9(10).
00317	02 KIN-STREET	PIC X(20).
00318	02 KIN-CITY	PIC X(20).
00319	02 KIN-STATE	PIC X(02).
00320	02 KIN-ZIP	PIC 9(05).
00321	02 MARITAL-STATUS	PIC X(01).

00323	FD MATH-REORG LABEL RECORD IS STANDARD DATA RECORD IS	
00324	MATH-REORG-REC.	
00325	01 MATH-REORG-REC.	
00326	02 ATTEND-DATA	PIC X(100).
00327	02 MRR-DATA	PIC X(70).
00328	02 SSN	PIC 9(09).
00329	02 ADVISOR-NAME	PIC X(18).
00330	02 ADVISOR-SSN	PIC 9(09).
00331		
00332		

00334	WORKING-STORAGE SECTION.	
00335	77 FRR-MSG-LINE	PIC X(133) VALUE SPACES.
00336	77 WORK-AREA1	PIC X(133).
00337	77 WORK-AREA2	PIC X(133).
00338	77 CURRENT-QTR-CODE	PIC 9(02).
00339	77 CURRENT-QTR	PIC 9(03).
00340	77 CTR	PIC 9(10).
00341	77 PTR	PIC 9(10).
00342	77 MATH-CHANGE-MADE	PIC X(01) VALUE 'Y'.
00343	77 SUBSCRPT	PIC 9(10) VALUE IS ZERO, USAGE COMP.
00344	77 HEADINGS	PIC X(20).
00345	77 OUTPUT-FORMAT	PIC X(20).
00346	77 BREAK	PIC X(20).
00347	77 DATE-BUFF	PIC X(06).
00348	* YYMMDD	
00349	77 TEMP	PIC X(20).
00350	77 ERROR-WARNING	PIC X(18) VALUE !*** ERROR WARNING!!.
00351	77 BREAK-STATUS	PIC X(03) VALUE ' NO'.
00352	77 KODE	PIC X(01) VALUE SPACES.
00353	77 BREAK-1	PIC X(04).
00354	77 BREAK-2	PIC X(01).
00355	77 BREAK-3	PIC 9(09).
00356	77 VALIDITY-INDICATOR	PIC X(07).
00357	77 SSNUM	PIC 9(09).
00358	77 QTR-BUFF	PIC 9(03) VALUE ZEROS.
00359	77 DELETE-CHAR	PIC X(01) VALUE SPACES.
00360	01 RECORD-BUFF.	
00361	02 ATTEND-DATA	PIC X(100).

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00362      02 MBR-DATA          PIC X(70).
00363      02 SSN              PIC 9(09).
00364      02 ADVISOR-NAME    PIC X(18).
00365      02 ADVISOR-SSN     PIC 9(09).
00366
00367      01 FTU-LAST-QTR-EDIT.
00368          05 LAST-YR-ATT-EDIT  PIC 9(02).
00369          05 FILLER        PIC X(01).
00370      01 ACCUMULATORS.
00371          03 COMP-UG         PIC 9(04) VALUE ZERO.
00372          03 COMP-GR         PIC 9(04) VALUE ZERO.
00373          03 COMP-PB         PIC 9(04) VALUE ZERO.
00374          03 COMPTOT        PIC 9(04) VALUE ZERO.
00375          03 MATH-UG         PIC 9(04) VALUE ZERO.
00376          03 MATH-GR         PIC 9(04) VALUE ZERO.
00377          03 MATH-PB         PIC 9(04) VALUE ZERO.
00378          03 MATHTOT        PIC 9(04) VALUE ZERO.
00379          03 STAT-UG         PIC 9(04) VALUE ZERO.
00380          03 STATTOT        PIC 9(04) VALUE ZERO.
00381          03 TOTSTUDS       PIC 9(04) VALUE ZERO.
00382      01 FORMER-STUD-HEAD.
00383          05 FILLFR        PIC X(39) VALUE SPACES.
00384          05 FILLFR        PIC X(56) VALUE 'NOT CURRENTLY ENROLLE'.
00385      -   'D BUT LISTED IN MATH DEPT DATA BASE'.
00386          05 FILLER        PIC X(38) VALUE SPACES.
00387      01 INDEX-CONVERT.
00388          05 INDEX-DATA      PIC X(70).
00389          05 FILLER        PIC X(130) VALUE *****.
00390      -   *****.
00391      01 ATTEND-ARRAY      PIC X(120).
00392      01 ATTEND-TAB REDEFINES ATTEND-ARRAY.
00393          02 QTR-ATTEND     PIC X(04) OCCURS 30 INDEXED BY Q.
00394      01 MBR-TAB-FIELD     PIC X(100).
00395      01 MBR-TAB REDEFINES MBR-TAB-FIELD.
00396          02 MBR            PIC X(10) OCCURS 10 INDEXED BY M.
00397      01 RECORD-CHANGE.
00398          02 FILLER        PIC X(14) VALUE ' STUDENT SSN: '.
00399          02 SSN            PIC 9(09).
00400          02 FILLFR        PIC X(16) VALUE ' FIELD CHANGED: '.
00401          02 FIELD-CHANGED   PIC X(12).
00402          02 NEW-DATA       PIC X(82).
00403      01 STUD-REC-TEMP.
00404          02 ATTEND-DATA    PIC X(80) VALUE SPACES.
00405          02 MBR-DATA       PIC X(70) VALUE SPACES.
00406          02 SSN            PIC 9(09) VALUE ZEROS.
00407          02 ADVISOR-NAME   PIC X(18) VALUE SPACES.
00408          02 ADVISOR-SSN     PIC 9(09) VALUE ZEROS.
00409      01 TODAYS-DATE.
00410          02 CURRENT-DAYT.
00411          05 YY             PIC 9(02).
00412          05 MM             PIC 9(02).
00413          05 DD             PIC 9(02).
00414      01 MONTH-TAB-DATA   PIC X(36) VALUE 'JANFEBMARAPR MAY JUN JUL'.
00415      -   'AUGSEP OCT NOV DEC'.
00416      01 MONTH-TAB REDEFINES MONTH-TAB-DATA.
00417          02 MONTH-ALPHA    PIC X(03) OCCURS 12 TIMES.
00418      01 DATE-IN-PRINT-FORM.

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02 MONTH	PIC X(03).
02 FILLER	PIC X(01) VALUE SPACES.
02 DD	PIC 9(02).
02 FTLLER	PIC X(03) VALUE '19'.
02 YY	PIC 9(02).
 01 QTR-CONVERT-TAB.	
05 FILLER	PIC X(78) VALUE '69169269369470170270
- 37047117127137147217227237247317327337347417427437447517521.	
05 FILLER	PIC X(60) VALUE '75
- 37547617627637647717727737747817827837847917927937948018021.	
05 FILLER	PIC X(60) VALUE '80
- 38048118128138148218228238248318328338348418428438448518521.	
05 FILLER	PIC X(60) VALUE '85
- 38548618628638648718728738748818828838848918928938949019021.	
05 FILLER	PIC X(06) VALUE '903904'.
01 QTR-TAB REDEFINES QTR-CONVERT-TAB.	
02 YR-QTR OCCURS 88 TIMES INDEXED BY YQ.	
05 QTR	PIC 9(03).
01 INDEX-ARRAY-LOAD-FIELD	PIC X(200).
01 INDEX-ARRAY REDEFINES INDEX-ARRAY-LOAD-FIELD.	
02 INDEX-ENTRY OCCURS 40 TIMES.	
05 GRD-IND	PIC 9(01).
05 START-SUB	PIC 9(02).
05 END-SUB	PIC 9(02).
01 PAGE-HEAD-DEPT.	
05 FILLER	PIC X(49) VALUE SPACES.
05 FILLER	PIC X(35) VALUE 'DEPARTMENT OF MATHEMA
- TICAL SCIENCES'.	
05 FILLER	PIC X(49) VALUE SPACES.
01 TITLE-ROST.	
05 FILLER	PIC X(44) VALUE SPACES.
05 TITLE-LINE	PIC X(46).
05 FILLER	PIC X(43) VALUE SPACES.
01 STUD-STAT-HEAD.	
05 FILLER	PIC X(58) VALUE SPACES.
05 FILLER	PIC X(18) VALUE 'STUDENT ENROLLMENT'.
05 FILLER	PIC X(57) VALUE SPACES.
01 DATE-HEAD.	
05 FILLER	PIC X(61) VALUE SPACES.
05 DATE-OUT	PIC X(11).
05 FILLER	PIC X(61) VALUE SPACES.
01 STUD-STAT-COL-HEAD.	
05 FILLER	PIC X(56) VALUE SPACES.
05 FILLER	PIC X(19) VALUE 'COMP
05 FILLER	PIC X(16) VALUE 'STAT
05 FILLER	PIC X(42) VALUE SPACES.
MATH TOTAL'.	
01 STUD-STAT-UNGRAD.	
05 FILLER	PIC X(41) VALUE SPACES.
05 FILLER	PIC X(15) VALUE 'UNDERGRADUATE '.
05 COMP-UG	PIC ZZZ9 VALUE ZEROS.
05 FILLER	PIC X(06) VALUE SPACES.
05 MATH-UG	PIC ZZZ9 VALUE ZEROS.
05 FILLER	PIC X(06) VALUE SPACES.
05 STAT-UG	PIC ZZZ9 VALUE ZEROS.
05 FILLER	PIC X(06) VALUE SPACES.
05 TOT-UG	PIC ZZZZ9 VALUE ZEROS.

00476	05 FILLER	PIC X(42)	VALUE SPACES.
00477	01 STUD-STAT-GRAD.	PIC X(41)	VALUE SPACES.
00478	05 FILLER	PIC X(15)	VALUE 'GRADUATE
00479	05 FILLER	PIC ZZZ9	VALUE ZEROS.
00480	05 COMP-GR	PIC X(06)	VALUE SPACES.
00481	05 FILLER	PIC ZZZ9	VALUE ZEROS.
00482	05 MATH-GR	PIC X(16)	VALUE SPACES.
00483	05 FILLER	PIC ZZZZ9	VALUE ZEROS.
00484	05 TOT-GR	PIC X(42)	VALUE SPACES.
00485	05 FILLER	PIC X(41)	VALUE SPACES.
00486	01 STUD-STAT-TOT.	PIC X(15)	VALUE 'TOTAL
00487	05 FILLER	PIC ZZZ9	VALUE ZEROS.
00488	05 COMPTOT	PIC X(06)	VALUE SPACES.
00489	05 FILLER	PIC ZZZ9	VALUE ZEROS.
00490	05 MATHTOT	PIC X(06)	VALUE SPACES.
00491	05 FILLER	PIC ZZZ9	VALUE ZEROS.
00492	05 STATTOT	PIC X(07)	VALUE SPACES.
00493	05 FILLER	PIC ZZZ9	VALUE ZEROS.
00494	05 TOTSTUDS	PIC X(42)	VALUE SPACES.
00495	05 FILLER	PIC X(41)	VALUE SPACES.
00496	05 FILLER	PIC X(15)	VALUE 'POST BAC
00497	01 STUD-STAT-POST-BAC.	PIC ZZZ9	VALUE ZEROS.
00498	05 FILLER	PIC X(06)	VALUE SPACES.
00499	05 FILLER	PIC ZZZ9	VALUE ZEROS.
00500	05 COMP-PB	PIC X(16)	VALUE SPACES.
00501	05 FILLER	PIC ZZZ9	VALUE ZEROS.
00502	05 MATH-PB	PIC X(42)	VALUE SPACES.
00503	05 FILLER	PIC X(16)	VALUE SPACES.
00504	05 TOT-PB	PIC ZZZZ9	VALUE ZEROS.
00505	05 FILLER	PIC X(42)	VALUE SPACES.
00506	01 ABBR-NAME.	PIC X(15)	.
00507	05 LAST-NAME	PIC X(10)	.
00508	05 FRST-MDLE-NAME	PIC X(15)	.
00509	01 FAC-ADV-HEAD.	PIC X(55)	VALUE SPACES.
00510	05 FILLER	PIC X(16)	VALUE 'FACULTY ADVISOR '.
00511	05 FILLER	PIC X(07)	VALUE 'LISTNG'.
00512	05 FILLER	PIC X(55)	VALUE SPACES.
00513	01 FAC-ADV-COL-HEAD.	PIC X(47)	VALUE SPACES.
00514	05 FILLER	PIC X(07)	VALUE 'STUDENT'.
00515	05 FILLER	PIC X(21)	VALUE SPACES.
00516	05 FILLER	PIC X(15)	VALUE 'FACULTY ADVISOR'.
00517	05 FILLER	PIC X(43)	VALUE SPACES.
00518	01 FAC-ADV-DET-LINE.	PIC X(42)	VALUE SPACES.
00519	05 FILLER	PIC X(25)	.
00520	05 FILLER	PIC X(07)	VALUE SPACES.
00521	05 NAME	PIC X(18)	.
00522	05 FILLER	PIC X(41)	VALUE SPACES.
00523	05 ADVISOR-NAME	PIC X(10)	VALUE SPACES.
00524	05 FILLER	PIC X(45)	VALUE 'THE FOLLOWING NAMED S
00525	01 ADVISEE-HEAD.	PIC X(18)	.
00526	05 FILLER	PIC X(60)	VALUE SPACES.
00527	05 FILLER	PIC X(45)	VALUE 'THE FOLLOWING NAMED S
00528	- * STUDENTS ARE ADVISEES OF *	PIC X(18)	.
00529	05 ADVISOR-NAME	PIC X(60)	VALUE SPACES.
00530	05 FILLER	PIC X(42)	VALUE SPACES.
00531	01 ADVISEE-HEAD-ALT.	PIC X(41)	VALUE SPACES.
00532		PIC X(42)	VALUE SPACES.

00533 05 FILLER PIC X(10) VALUE SPACES.
 00534 05 FILLER PTC X(73) VALUE 'THE FOLLOWING NAMED S
 00535 - STUDENTS ARE ADVISEES OF THE FACULTY MEMBER INDICATED'.
 00536 05 FILLER PTC X(50) VALUE SPACES.
 00537 01 CURRENT-QTR-PRINT.
 00538 05 FILLER PIC X(65) VALUE SPACES.
 00539 05 QTR-PRINT PIC X(03) VALUE SPACES:
 00540 05 FILLER PIC X(65) VALUE SPACES.
 00541 01 NAME-LINE.
 00542 05 FILLER PIC X(01) VALUE SPACES.
 00543 05 LAST-NAME PIC X(18):
 00544 05 FRST-MOLE-NAME PIC X(30):
 00545 05 FILLER PIC X(01) VALUE SPACES.
 00546 05 SSN PIC 999B999B999B.
 00547 05 GRAD-UG-PB PIC X(01).
 00548 05 FILLER PIC X(01) VALUE '-'.
 00549 05 MAJOR PIC X(04).
 00550 05 FILLER PIC X(01) VALUE SPACES.
 00551 05 FTU-LAST-QTR.
 00552 06 LAST-YR-ATT PIC 9(02).
 00553 06 LAST-QTR-ATT PIC X(01):
 00554 05 FILLER PIC X(01) VALUE '//.
 00555 05 GPA PIC 9.999.
 00556 05 FILLER PIC X(10) VALUE ' ADVISOR: '.
 00557 05 ADVISOR-NAME PIC X(18).
 00558 05 FILLER PIC X(06) VALUE ' SEX: '.
 00559 05 SEX PIC X(01).
 00560 05 FILLER PIC X(01) VALUE SPACES.
 00561 05 FILLER PIC X(12) VALUE ' MARITAL ST:'.
 00562 05 MARITAL-STATUS PIC X(01).
 00563 05 FILLER PIC X(04) VALUE ' GR:'.
 00564 05 GRAD PIC X(01).
 00565 01 ADDR-LINE.
 00566 05 FILLER PIC X(18) VALUE ' ADDRESS: '.
 00567 05 FILLER PIC X(02) VALUE SPACES.
 00568 05 HOME-STREET PIC X(20).
 00569 05 FILLER PIC X(01) VALUE SPACES.
 00570 05 HOME-CITY PIC X(20).
 00571 05 HOME-STATE PIC BXBX.
 00572 05 HOME-ZIP PIC X(05).
 00573 05 FILLER PIC X(12) VALUE ' LOCAL TEL: '.
 00574 05 HOME-PHONE PIC XXXBXXXXBXXXX.
 00575 05 FILLER PIC X(08) VALUE ' MEMBR: '.
 00576 05 MBR-DATA PIC X(31).
 00577 01 ADDR-PARENT-LINE.
 00578 05 FILLER PIC X(15) VALUE SPACES.
 00579 05 FILLER PIC X(08) VALUE 'PARENT: '.
 00580 05 KIN-STREET PIC X(20).
 00581 05 FILLER PIC X(01) VALUE SPACES.
 00582 05 KIN-CITY PIC X(20).
 00583 05 KIN-STATE PIC BXBX.
 00584 05 KIN-ZIP PIC X(05).
 00585 05 FILLER PIC X(63) VALUE SPACES.
 00586
 00587 01 FTU-ATTN-LINE.
 00588 05 FILLER PIC X(35) VALUE ' QTRS ATTENDE
 00589 - 'D FTU/STATUS: '.

00590 05 ATTEND-DATA PIC X(70).
00591 01 WARNING-MSG. PIC X(40) VALUE ' * WARNING: INPUT CAR
00592 05 FILLER PIC X(95) VALUE SPACES.
00593 - 'D NOT PROCESSED **. PIC X(10) VALUE SPACES.
00594 05 FILLER PIC X(25).
00595 01 ADVISEE-DET-LINE. PIC X(98) VALUE SPACES.
00596 05 FILLER
00597 05 NAME
00598 05 FILLER

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00600      ***** REFERENCE HIPO 2.0 *****
00601      PROCEDURE DIVISION.
00602          PERFORM ACCEPT-DATE-FROM-SYSTEM.
00603          OPEN INPUT CARD-IN.
00604          READ CARD-IN AT END GO TO EOJ.
00605          PERFORM LOAD-CURRENT-QTR-DATA.
00606          IF KODE = 'T' GO TO EOJ.
00607          READ CARD-IN AT END GO TO EOJ.
00608          PERFORM LOAD-FTU-DATA THRU END-FTU-DATA-SECTION.
00609          READ-CARD-LOOP.
00610          READ CARD-IN AT END GO TO EOJ.
00611          PERFORM CARD-FORMAT-VERIFY.
00612          IF VALIDITY-INDICATOR = 'INVALID' GO TO READ-CARD-LOOP.
00613          IF COOD = 'R' OR 'F' OR 'A' OR 'C'.
00614          PERFORM GENERATE-REPORTS, MOVE 'N' TO MATH-CHANGE-MADE.
00615          IF COOD = 'H' PERFORM MATH-LOAD-UPDATE.
00616          IF COOD = 'V' OR 'Q' OR 'Z' OR 'M' OR 'X' OR 'D'
00617          MOVE 'Y' TO MATH-CHANGE-MADE
00618          PERFORM LOAD-MATH-CHANGE-FILE THRU
00619              END-LOAD-MATH-CHANGE-FILE,
00620          PERFORM MATH-LOAD-UPDATE.
00621          GO TO READ-CARD-LOOP.
00622
00623          CLOSE CARD-IN.
00624          STOP RUN.

00626          ACCEPT-DATE-FROM-SYSTEM.
00627          ACCEPT CURRENT-DAYT FROM DATE.
00628          MOVE DD OF CURRENT-DAYT TO DD OF DATE-IN-PRINT-FORM.
00629          MOVE YY OF CURRENT-DAYT TO YY OF DATE-IN-PRINT-FORM.
00630          MOVE MONTH-ALPHA (MM OF CURRENT-DAYT) TO MONTH OF
00631          DATE-IN-PRINT-FORM.
00632          MOVE DATE-IN-PRINT-FORM TO DATE-OUT OF DATE-HEAD.

00634          LOAD-CURRENT-QTR-DATA.
00635          IF COOD IS NOT EQUAL TO 'Y' THEN
00636              MOVE ' **MISSING OR OUT OF SEQUENCE CURRENT QUARTER CARD P
00637              - 'PROCESSING TERMINATING.' TO ERR-MSG-LINE
00638                  PERFORM INVALID-INPUT
00639                  MOVE 'T' TO KODE
00640                  GO TO END-CURRENT-QTR-DATA.
00641                  MOVE DATA-Y TO CURRENT-QTR.
00642                  SET YQ TO 1.
00643                  MOVE 1 TO PTR.
00644                  SEARCH YR-QTR VARYING PTR
00645                  AT END MOVE ' * INVALID CURRENT QUARTER SPECIFIED ON INPUT
00646                  - 'CARD - PROCESSING TERMINATING.' TO ERR-MSG-LINE
00647                  PERFORM INVALID-INPUT
00648                  MOVE 'T' TO KODE
00649                  GO TO END-CURRENT-QTR-DATA
00650                  WHEN CURRENT-QTR IS EQUAL TO YR-QTR (YQ)
00651                      MOVE PTR TO CURRENT-QTR-CODE.
00652                      OPEN OUTPUT PRINT-FILE.
00653                      MOVE SPACES TO PRINT-LINE.
00654                      WRITE PRINT-LINE FROM CURRENT-QTR-CODE AFTER POSITIONING 3

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16

00655
00656
00657

LINES.
CLOSE PRINT-FILE.
END-CURRENT-QTR-DATA. EXIT.

14

00659 INVALID-INPUT SECTION.
00660 OPEN OUTPUT PRINT-FILE.
00661 WRITE PRINT-LINE FROM ERROR-WARNING
 AFTER POSITIONING 3 LINES.
00662 WRITE PRINT-LINE FROM ERR-MSG-LINE
 AFTER POSITIONING 2 LINES.
00663 MOVE SPACES TO ERR-MSG-LINE.
00664 STRING ! THE FOLLOWING INPUT CARD DISREGARDED: ! CODE-CHECK
00665 DELIMITED BY SIZE
00666 INTO ERR-MSG-LINE.
00667 WRITE PRINT-LINE FROM ERR-MSG-LINE
 AFTER POSITIONING 2 LINES.
00668 MOVE SPACES TO ERR-MSG-LINE.
00669
00670
00671
00672 CLOSE PRINT-FILE.

00674 CARD-FORMAT-VERIFY SECTION.
00675 REPORT-REQUEST.
00676 MOVE 'VALID' TO VALIDITY-INDICATOR.
00677 IF COOD = 'R' OR 'F' OR 'A' OR 'C'
00678 THEN IF REST IS NOT EQUAL TO SPACES THEN
00679 MOVE 'ILLEGAL ENTRY ON REPORT REQUEST' TO ERR-MSG-LINE
00680 PERFORM INVALID-INPUT
00681 MOVE 'INVALID' TO VALIDITY-INDICATOR.
00682 IF COOD = 'H'
00683 THEN IF HIST-DATA IS NOT NUMERIC OR FILLER-H IS NOT = ''
00684 MOVE 'ILLEGAL ENTRY ON HISTORY ALTERATION REQUEST'
00685 TO ERR-MSG-LINE
00686 PERFORM INVALID-INPUT
00687 MOVE 'INVALID' TO VALIDITY-INDICATOR.
00688 IF COOD = 'Y'
00689 THEN IF DATA-Y IS NOT NUMERIC OR FILLER-Y IS NOT = ''
00690 MOVE 'ILLEGAL ENTRY ON YEAR AND QUARTER INPUT CARD'
00691 TO ERR-MSG-LINE
00692 PERFORM INVALID-INPUT
00693 MOVE 'INVALID' TO VALIDITY-INDICATOR.
00694 IF COOD = '1' OR '2' OR '3' OR '4' OR 'V' OR 'Q' OR 'D'
00695 OR 'Z' OR 'M' OR 'X'
00696 THEN IF SSN OF BASIC-DATA-1 IS NOT NUMERIC THEN
00697 MOVE 'INVALID SSN ON INPUT CARD' TO ERR-MSG-LINE
00698 PERFORM INVALID-INPUT
00699 MOVE 'INVALID' TO VALIDITY-INDICATOR.
00700 IF COOD = 'V'
00701 THEN IF ADVISOR-NAME OF ADVISOR-V IS NOT ALPHABETIC
00702 OR ADVISOR-SSN OF ADVISOR-V IS NOT NUMERIC
00703 MOVE 'ILLEGAL INPUT ON ADVISOR INPUT CARD' TO
00704 ERR-MSG-LINE
00705 PERFORM INVALID-INPUT
00706 MOVE 'INVALID' TO VALIDITY-INDICATOR.
00707 IF COOD = '*' GO TO END-VERIFY.
00708 IF COOD IS NOT EQUAL TO 'R' AND 'F' AND 'A' AND 'C' AND 'H'
00709 AND 'Y' AND '1' AND '2' AND '3' AND '4' AND 'V' AND 'Q'
00710 AND 'D' AND 'Z' AND 'M' AND 'X' THEN
00711 MOVE 'INVALID' TO VALIDITY-INDICATOR
00712 MOVE 'INVALID CODE IN COLUMN 1 OF INPUT CARD' TO
00713 ERR-MSG-LINE
00714 PERFORM INVALID-INPUT.
00715 END-VERIFY.

00717 LOAD-MATH-CHANGE-FILE SECTION.
00718 OPEN OUTPUT MATH-CHANGE.
00719 READ-INTO-MATH-CHANGE.
00720 MOVE SPACES TO CODE-CHECK-W.
00721 MOVE CODE-CHECK TO CODE-CHECK-W.
00722 WRITE CODE-CHECK-W.
00723 READ-CHANGE.
00724 READ CARD-IN AT END GO TO END-LOAD-MATH-CHANGE-FILE.
00725 PERFORM CARD-FORMAT-VERIFY.
00726 IF VALIDITY-INDICATOR = 'INVALID' GO TO
00727 READ-CHANGE.
00728 IF COOD IS EQUAL TO 'V' OR 'Q' OR 'Z' OR 'M' OR 'X' OR 'D'
00729 THEN GO TO READ-INTO-MATH-CHANGE.
00730 IF COOD IS NOT EQUAL TO '*'
00731 THEN OPEN OUTPUT PRINT-FILE
00732 MOVE ' * EXPECTED TO FIND * AT END OF MATH CHANGE
00733 - CARD INPUT - FOUND INSTEAD THE FOLLOWING DATA WHICH IS DISPRE
00734 - GARDED: ' TO PRINT-LINE
00735 WRITE PRINT-LINE AFTER POSITIONING 2 LINES
00736 STRING ' * CARD IMAGE: ' CODE-CHECK DELIMITED BY SIZE
00737 INTO PRINT-LINE
00738 WRITE PRINT-LINE AFTER POSITIONING 2 LINES
00739 CLOSE PRINT-FILE.
00740 CLOSE MATH-CHANGE.
00741 MOVE 102400 TO SORT-CORE-SIZE
00742 SORT INPUT-SORT-FILE
00743 ASCENDING KEY SSN OF INPUT-SORT
00744 USING MATH-CHANGE
00745 GIVING MATH-CHANGE.
00746 END-LOAD-MATH-CHANGE-FILE. EXIT.

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00748      ##### REFERENCE HIPO 2.1 #####
00749      MATH-LOAD-UPDATE SECTION.
00750      IF COOD = 'H' THEN PERFORM STAT-HIST THRU EXIT-STAT-HIST
00751      ELSE PERFORM MERGE-MATH-DATA THRU END-MERGE-MATH-DATA.
00752      GO TO END-MATH-LOAD-UPDATE-SECTION.

00754      MERGE-MATH-DATA.
00755      OPEN I-O MATH-DEPT-STUD-DB.
00756      OPEN INPUT MATH-CHANGE.
00757      OPEN OUTPUT MATH-REORG.
00758      MOVE SPACES TO MATH-REORG-REC.
00759      READ MATH-CHANGE AT END GO TO TRANSFER-REST-OF-MATH-FILE.
00760      READ MATH-DEPT-STUD-DB AT END GO TO CLOSE-MATH-FILES.
00761      PERFORM INITIALIZE-RECORD-BUFF.
00762      IF SSN OF MATH-CHANGE-REC < SSN OF STUD-REC-M
00763      THEN PERFORM CREATE-MATH-REC, PERFORM READ-MATH-CHANGE
00764      ELSE MOVE CORR STUD-REC-M TO RECORD-BUFF, PERFORM
00765          READ-FILES-TO-BE-MERGED.
00766      GO TO COMPARE-FOR-MERGE.

00768      READ-FILES-TO-BE-MERGED.
00769      READ MATH-DEPT-STUD-DB AT END
00770          PERFORM WRITE-NEW-FILES-ONLY
00771          GO TO CLOSE-MATH-FILES.
00772      READ-MATH-CHANGE.
00773      READ MATH-CHANGE AT END
00774          GO TO TRANSFER-REST-OF-MATH-FILE.
00775
00776      COMPARE-FOR-MERGE.
00777      IF SSN OF MATH-CHANGE-REC = SSN OF RECORD-BUFF
00778          PERFORM UPDATE-MATH-REC, PERFORM READ-MATH-CHANGE
00779          GO TO COMPARE-FOR-MERGE.
00780      IF DELETE-CHAR IS NOT = 'D'
00781          THEN IF SSN OF RECORD-BUFF IS NOT = 0
00782              THEN WRITE MATH-REORG-REC FROM RECORD-BUFF
00783                  PERFORM INITIALIZE-RECORD-BUFF
00784          ELSE NEXT SENTENCE
00785              ELSE MOVE SSN OF RECORD-BUFF TO SSN OF MATH-REORG-REC
00786                  PERFORM INITIALIZE-RECORD-BUFF
00787                  MOVE SSN OF MATH-REORG-REC TO SSN OF RECORD-BUFF
00788                  WRITE MATH-REORG-REC FROM RECORD-BUFF.
00789          MOVE SPACES TO DELETE-CHAR.
00790      IF SSN OF MATH-CHANGE-REC = SSN OF STUD-REC-M
00791          THEN MOVE CORR STUD-REC-M TO RECORD-BUFF,
00792              PERFORM UPDATE-MATH-REC
00793              PERFORM READ-MATH-CHANGE
00794              PERFORM READ-FILES-TO-BE-MERGED
00795      ELSE IF SSN OF MATH-CHANGE-REC > SSN OF STUD-REC-M
00796          THEN MOVE STUD-REC-M TO RECORD-BUFF
00797              WRITE MATH-REORG-REC FROM RECORD-BUFF
00798              PERFORM INITIALIZE-RECORD-BUFF
00799              PERFORM READ-FILES-TO-BE-MERGED
00800          ELSE PERFORM CREATE-MATH-REC
00801              PERFORM READ-MATH-CHANGE.
00802      GO TO COMPARE-FOR-MERGE.

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00803      INITIALIZE-RECORD-BUFF.
00804      MOVE SPACES TO RECORD-BUFF, MOVE ZEROS TO SSN OF
00805      RECORD-BUFF, MOVE ZEROS TO ADVISOR-SSN OF RECORD-BUFF.
00806
00807
00808      WRITE-NEW-FILES-ONLY.
00809      IF SSN OF RECORD-BUFF IS EQUAL TO 0
00810          THEN PERFORM CREATE-MATH-REC
00811      ELSE IF SSN OF RECORD-BUFF IS EQUAL TO SSN OF
00812          MATH-CHANGE-REC
00813          THEN PERFORM CREATE-MATH-REC
00814      ELSE WRITE MATH-REORG-REC FROM RECORD-BUFF
00815          PERFORM INITIALIZE-RECORD-BUFF,
00816          PERFORM CREATE-MATH-REC
00817      READ MATH-CHANGE AT END WRITE MATH-REORG-REC FROM
00818      RECORD-BUFF, GO TO CLOSE-MATH-FILES.
00819      GO TO WRITE-NEW-FILES-ONLY.
00820
00821      TRANSFER-REST-OF-MATH-FILE.
00822      IF SSN OF RECORD-BUFF IS NOT = 0
00823          THEN IF SSN OF RECORD-BUFF = SSN OF STUD-REC-M
00824              THEN WRITE MATH-REORG-REC FROM RECORD-BUFF
00825                  PERFORM INITIALIZE-RECORD-BUFF
00826          ELSE WRITE MATH-REORG-REC FROM RECORD-BUFF
00827              PERFORM INITIALIZE-RECORD-BUFF
00828                  WRITE MATH-REORG-REC FROM STUD-REC-M
00829          ELSE WRITE MATH-REORG-REC FROM STUD-REC-M.
00830      READ MATH-DEPT-STUD-DB AT END GO TO CLOSE-MATH-FILES.
00831      GO TO TRANSFER-REST-OF-MATH-FILE.
00832      CLOSE-MATH-FILES.
00833      MOVE SPACES TO DELETE-CHAR.
00834      CLOSE MATH-DEPT-STUD-DB,
00835          MATH-CHANGE,
00836          MATH-REORG.
00837      OPEN INPUT MATH-REORG,
00838          OUTPUT MATH-DEPT-STUD-DB.

00840      TRANSFER-TO-MATH-DR.
00841      READ MATH-REORG AT END GO TO END-MERGE-MATH-DATA.
00842      MOVE SPACES TO STUD-REC-M.
00843      MOVE ZEROS TO SSN OF STUD-REC-M, MOVE ZEROS TO ADVISOR-SSN
00844      OF STUD-REC-M.
00845      IF SSN OF MATH-REORG-REC IS NOT EQUAL TO 0
00846          THEN WRITE STUD-REC-M FROM MATH-REORG-REC.
00847      GO TO TRANSFER-TO-MATH-DR.
00848      END-MERGE-MATH-DATA.
00849      CLOSE MATH-REORG, MATH-DEPT-STUD-DB.

00851      ***** REFERENCE HIPO 2.1.1 *****
00852      CREATE-MATH-REC.
00853      IF COWD = 'V' MOVE CORR ADVISOR-W
00854          TO RECORD-BUFF,
00855      ELSE IF COWD = 'O' MOVE CORR FTU-ATTEND-W
00856          TO RECORD-BUFF,
00857      ELSE IF COWD = 'M' MOVE CORR ASSN-MBR-W

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00858      TO RECORD-BUFF.
00859      ELSE
00860          STRING ' CANNOT LOCATE RECORD TO BE CHANGED FOR SSN '
00861          SSN OF MBR-DELETE-W DELIMITED BY SIZE INTO
00862          ERR-MSG-LINE
00863          MOVE MATH-CHANGE-REC TO CODE-CHECK
00864          PERFORM INVALID-INPUT.

00866      ***** REFERENCE HIPO 2.1.2 *****
00867      UPDATE-MATH-REC.
00868          IF COWD = 'V' PERFORM CODE-V THRU CODE-V-EXIT.
00869          IF COWD = 'Q' PERFORM CODE-Q THRU CODE-Q-EXIT.
00870          IF COWD = 'M' PERFORM CODE-M THRU CODE-M-EXIT.
00871          IF COWD = 'Z' PERFORM CODE-Z THRU CODE-Z-EXIT.
00872          IF COWD = 'X' PERFORM CODE-X THRU CODE-X-EXIT.
00873          IF COWD = 'D' PERFORM CODE-D THRU CODE-D-EXIT.
00874
00875      CODE-V.
00876          MOVE CORR ADVISOR-W TO RECORD-BUFF.
00877          CODE-V-EXIT. EXIT.
00878
00879      CODE-Q.
00880          MOVE SPACES TO WORK-AREA1.
00881          MOVE SPACES TO WORK-AREA2.
00882          MOVE ATTEND-DATA OF FTU-ATTEND-W TO WORK-AREA1.
00883          MOVE ATTEND-DATA OF RECORD-BUFF TO WORK-AREA2.
00884          MOVE SPACES TO ATTEND-DATA OF RECORD-BUFF.
00885          STRING WORK-AREA2 WORK-AREA1 DELIMITED BY
00886          ' ' INTO ATTEND-DATA OF RECORD-BUFF.
00887          CODE-Q-EXIT. EXIT.
00888
00889      CODE-M.
00890          MOVE SPACES TO WORK-AREA1.
00891          MOVE SPACES TO WORK-AREA2.
00892          MOVE MBR-DATA OF ASSN-MBR-W TO WORK-AREA1.
00893          MOVE MBR-DATA OF RECORD-BUFF TO WORK-AREA2.
00894          MOVE SPACES TO MAR-DATA OF RECORD-BUFF.
00895          STRING WORK-AREA2 ' ' WORK-AREA1 DELIMITED
00896          BY ' ' INTO MBR-DATA OF RECORD-BUFF.
00897          CODE-M-EXIT. EXIT.
00898
00899      CODE-D.
00900          MOVE 'D' TO DELETE-CHAR.
00901          CODE-D-EXIT. EXIT.
00902
00903      CODE-Z.
00904          IF ATTEND-DATA OF FTU-ATTEND-DELETE-W IS EQUAL TO SPACES
00905          THEN MOVE SPACES TO ATTEND-DATA OF RECORD-BUFF.
00906          GO TO CODE-Z-EXIT.
00907          MOVE SPACES TO ATTEND-ARRAY.
00908          MOVE ATTEND-DATA OF RECORD-BUFF TO ATTEND-ARRAY.
00909          MOVE 1 TO PTR.
00910          SET Q TO 1.
00911          SEARCH QTR-ATTEND VARYING PTR AT END MOVE
00912          ' ATTENDANCE DATA ENTRY TO BE DELETED NOT FOUND ' TO
00913          ERR-MSG-LINE

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00914      PERFORM INVALID-INPUT
00915      WHEN QTR-ATTEND (Q) = ATTEND-DATA OF FTU-ATTEND-DELETE-W
00916          MOVE ZEROS TO QTR-ATTEND (Q)
00917          PERFORM FILL-IN-A UNTIL PTR = 30
00918          MOVE ATTEND-ARRAY TO ATTEND-DATA OF RECORD-BUFF.
00919      CODE-Z-EXIT. EXIT.
00920
00921      FILL-IN-A.
00922          MOVE QTR-ATTEND (Q + 1) TO QTR-ATTEND (Q).
00923          SET Q UP BY 1.
00924          ADD 1 TO PTR.
00925      END-FILL-IN-A. EXIT.
00926
00927      CODE-X.
00928          MOVE SPACES TO MBR-TAB-FIELD.
00929          SET M TO 1.
00930          MOVE 1 TO PTR.
00931          UNSTRING MBR-DATA OF RECORD-BUFF DELIMITED BY ',' INTO
00932              MBR (M) MBR (M + 1) MBR (M + 2) MBR (M + 3) MBR (M + 4)
00933              MBR (M + 5) MBR (M + 6) MBR (M + 7) MBR (M + 8)
00934              MBR (M + 9) MBR (M + 10).
00935          SEARCH MBR VARYING PTR AT END MOVE
00936              ' MEMBERSHIP ENTRY TO BE DELETED NOT FOUND '
00937              TO ERR-MSG-LINE PERFORM INVALID-INPUT
00938          WHEN MBR (M) = ASSN-NAME OF MBR-DELETE-W
00939              MOVE SPACES TO MBR (M)
00940              PERFORM FILL-IN-M UNTIL PTR = 9
00941              MOVE MBR-TAB-FIELD TO MBR-DATA OF RECORD-BUFF.
00942      CODE-X-EXIT. EXIT.
00943
00944      FILL-IN-M.
00945          MOVE MBR (M + 1) TO MBR (M).
00946          SET M UP BY 1.
00947          ADD 1 TO PTR.
00948      END-FILL-IN-M. EXIT.

00950      ***** REFERENCE HIPO 2.1.3 *****
00951      STAT-HIST.
00952          OPEN I-O STAT-HIST-DB, OUTPUT HIST-REORG,
00953              OUTPUT PRINT-FILE.
00954          MOVE ZEROS TO HIST-REORG-REC.
00955          IF COOD = 'H'
00956              MOVE ZEROS TO ACCUMULATORS
00957              MOVE CORR HIST-DATA TO ACCUMULATORS
00958              MOVE QTR-H TO QTR-BUFF
00959              PERFORM READ-HIST THRU EXIT-READ-HIST.
00960              CLOSE STAT-HIST-DB, HIST-REORG, PRINT-FILE.
00961              IF QTR-BUFF IS NOT EQUAL TO 0
00962                  THEN IF ACCUMULATORS IS EQUAL TO 0
00963                      THEN MOVE
00964                          ' ENTRY TO BE DELETED NOT FOUND IN STATISTICS HIST FILE '
00965                          TO ERR-MSG-LINE.
00966                          PERFORM INVALID-INPUT.
00967                          PERFORM SORT-STAT-HIST.
00968      EXIT-STAT-HIST. EXIT.
00969

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00970 READ-HIST.
00971 READ STAT-HIST-DB AT END GO TO END-READ-HIST.
00972 IF QTR OF STAT-REC IS EQUAL TO QTR-BUFF
00973 THEN MOVE CORR ACCUMULATORS TO STAT-REC,
00974 MOVE ZEROS TO QTR-BUFF.
00975 IF COMP-UG OF STAT-REC IS NOT EQUAL TO 0
00976 THEN WRITE HIST-REORG-REC FROM STAT-REC.
00977 GO TO READ-HIST.
00978 END-READ-HIST.
00979 MOVE ZEROS TO HIST-REORG-REC.
00980 IF ACCUMULATORS IS NOT EQUAL TO 0
00981 THEN IF QTR-BUFF IS NOT EQUAL TO 0
00982 THEN MOVE CORR ACCUMULATORS TO HIST-REORG-REC
00983 MOVE QTR-BUFF TO QTR OF HIST-REORG-REC
00984 MOVE ZEROS TO QTR-BUFF
00985 WRITE HIST-REORG-REC.
00986 EXIT-READ-HIST. EXIT.
00987
00988 SORT-STAT-HIST.
00989 MOVE 102400 TO SORT-CORE-SIZE.
00990 SORT SORT-WORK-HDR
00991 DESCENDING KEY QTR OF SORT-HDR-REC
00992 USING HIST-REORG
00993 GIVING STAT-HIST-DB.
00994 END-MATH-LOAD-UPDATE-SECTION.

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00996 ***** REFERENCE HIPO 2.2 *****
00997 LOAD-FTU-DATA SECTION.
00998 IF COOD IS NOT EQUAL TO '1' AND '2' AND '3' AND '4' THEN
00999 GO TO GET-SPIN-OFF.
01000 OPEN OUTPUT SPIN-OFF.

01001
01002 INITIALIZE-SPO-REC.
01003 MOVE SPACES TO SPIN-OFF-REC.
01004 MOVE ZEROS TO SSN OF SPIN-OFF-REC.
01005 MOVE ZEROS TO FTU-SUMMARY OF SPIN-OFF-REC.

01006
01007 ***** REFERENCE HIPO 2.2.2 *****
01008 DECODE-SPIN-OFF.
01009 IF COOD = '1' MOVE CORR BASIC-DATA-1 TO SPIN-OFF-REC.
01010 IF COOD = '2' MOVE CORR STUD-ADDRESS-2 TO SPIN-OFF-REC.
01011 IF COOD = '3' MOVE CORR PARENTS-ADDRESS-3 TO SPIN-OFF-REC.
01012 IF COOD = '4' MOVE CORR INDEX-4 TO INDEX-CONVERT
01013 MOVE INDEX-CONVERT TO INDX OF SPIN-OFF-REC
01014 MOVE SSN OF INDEX-4 TO SSN OF SPIN-OFF-REC.
01015 END-DECODE. EXIT.

01016
01017 READ-NEXT-CARD.
01018 READ CARD-IN AT END GO TO
01019 CHECK-FOR-END-OF-SPO.
01020 IF COOD IS NOT EQUAL TO '1' AND '2' AND '3' AND '4' THEN
01021 WRITE SPIN-OFF-REC
01022 CLOSE SPIN-OFF
01023 GO TO CHECK-FOR-END-OF-SPO.
01024 IF SSN OF BASIC-DATA-1 IS NOT EQUAL TO SSN OF SPIN-OFF-REC
01025 THEN WRITE SPIN-OFF-REC
01026 PERFORM INITIALIZE-SPO-REC.
01027 PERFORM DECODE-SPIN-OFF THRU END-DECODE.
01028 GO TO READ-NEXT-CARD.

01029

01031 ***** REFERENCE HIPO 2.2.1 *****
01032 GET-SPIN-OFF.
01033 * GET-SPIN-OFF TO BE WRITTEN.

01035
01036 CHECK-FOR-END-OF-SPO.
01037 IF COOD IS NOT EQUAL TO '*' THEN
01038 MOVE '*' EXPECTED BUT DID NOT FIND * TO INDICATE END MARKER
01039 - 'R FOR SPIN-OFF ' TO ERR-MSG-LINE.
PERFORM INVALID-INPUT.

01041 ***** REFERENCE HIPO 2.2.3 *****
01042 LOAD-STUD-DB.
01043 OPEN INPUT SPIN-OFF.
01044 OPEN OUTPUT STUD-DATA-BASE.
01045 PERFORM INITIALIZE-STUD-DB-REC.
01046 TRANSFER-DATA.
01047 READ SPIN-OFF AT END GO TO END-OF-LOAD-STUD-DB.
01048 MOVE CORR SPIN-OFF-REC TO STUD-DB-REC.
01049 MOVE FTU-GPA OF SPIN-OFF-REC TO GPA OF STUD-DB-REC.

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01050      MOST-RECENT-QTR-AND-IF-GRAD.
01051      MOVE INDEX OF SPIN-OFF-REC TO INDEX-ARRAY-LOAD-FIELD.
01052      MOVE 0 TO CTR.
01053      SET-CTR-LOOP.
01054      MOVE CURRENT-QTR-CODE TO SUBSCRIPT, SUBTRACT CTR FROM
01055      SUBSCRIPT.
01056      IF INDEX-ENTRY (SUBSCRIPT)
01057      IS NOT EQUAL TO '*****', THEN
01058      GO TO HAS-STUD-GRADUATED.
01059      ADD 1 TO CTR.
01060      IF (CURRENT-QTR-CODE - CTR) > 0 GO TO SET-CTR-LOOP
01061      ELSE STRING ' * CANNOT DETERMINE LAST QTR ATTENDED FOR *
01062      LAST-NAME OF SPIN-OFF-REC FRST-MDLE-NAME OF SPIN-OFF-REC
01063      SSN OF SPIN-OFF-REC
01064      ' CHECK SPIN-OFF DATA AND CURRENT QTR INPUT'
01065      DELIMITED BY SIZE INTO ERR-MSG-LINE
01066      OPEN OUTPUT PRINT-FILE
01067      WRITE PRINT-LINE FROM ERR-MSG-LINE AFTER POSITIONING
01068      3 LINES
01069      CLOSE PRINT-FILE
01070      MOVE SPACES TO ERR-MSG-LINE.
01071      HAS-STUD-GRADUATED.
01072      IF (CURRENT-QTR-CODE - CTR) = 0
01073      THEN MOVE '1?' TO GRAD OF STUD-DB-REC
01074      MOVE ZEROS TO FTU-LAST-QTR OF STUD-DB-REC
01075      GO TO STUD-LEVEL-OF-STUDY.
01076      MOVE CURRENT-QTR-CODE TO SUBSCRIPT, SUBTRACT CTR FROM
01077      SUBSCRIPT.
01078      IF GRD-IND OF INDEX-ENTRY (SUBSCRIPT)
01079      IS EQUAL TO '1' OR '2'
01080      MOVE 'Y' TO GRAD OF STUD-DB-REC
01081      ELSE MOVE 'N' TO GRAD OF STUD-DB-REC.
01082      SET YQ TO SUBSCRIPT
01083      MOVE YR-QTR (YQ)
01084      TO FTU-LAST-QTR OF STUD-DB-REC.
01085      STUD-LEVEL-OF-STUDY.
01086      IF APPL-TYPE OF SPIN-OFF-REC < 5 MOVE 'U' TO
01087      GRAD-UG-PB OF STUD-DB-REC.
01088      IF APPL-TYPE OF SPIN-OFF-REC = 5 MOVE 'P' TO
01089      GRAD-UG-PB OF STUD-DB-REC.
01090      IF APPL-TYPE OF SPIN-OFF-REC = 6 OR APPL-TYPE OF SPIN-OFF-REC
01091      = 8 MOVE 'G' TO GRAD-UG-PB OF STUD-DB-REC.
01092      IF APPL-TYPE OF SPIN-OFF-REC IS NOT EQUAL TO 1 AND 2 AND 3
01093      AND 4 AND 5 AND 6 AND 8 THEN
01094      MOVE '1?' TO GRAD-UG-PB OF STUD-DB-REC
01095      STRING ' * CANNOT DETERMINE IF * LAST-NAME OF
01096      SPIN-OFF-REC FRST-MDLE-NAME OF SPIN-OFF-REC
01097      SSN OF SPIN-OFF-REC
01098      ' IS GRAD, UG, OR PB - IS NOT INCLUDED IN STATISTICS
01099      -   ' DELIMITED BY SIZE INTO ERR-MSG-LINE
01100      OPEN OUTPUT PRINT-FILE
01101      WRITE PRINT-LINE FROM ERR-MSG-LINE AFTER POSITIONING 3
01102      LINES
01103      CLOSE PRINT-FILE
01104      MOVE SPACES TO ERR-MSG-LINE.
01105      ENTER-STUD-MAJOR.
01106      IF MAJOR-1 OF SPIN-OFF-REC = 1701

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01107      THEN MOVE 'MATH' TO MAJOR OF STUD-DB-REC.  
01108      IF MAJOR-1 OF SPIN-OFF-REC = 1790  
01109          THEN MOVE 'MATH' TO MAJOR OF STUD-DB-REC.  
01110      IF MAJOR-1 OF SPIN-OFF-REC = 0701  
01111          THEN MOVE 'COMP' TO MAJOR OF STUD-DB-REC.  
01112      IF MAJOR-1 OF SPIN-OFF-REC = 1702  
01113          THEN MOVE 'STAT' TO MAJOR OF STUD-DB-REC.  
01114      IF MAJOR-1 OF SPIN-OFF-REC IS NOT EQUAL TO  
01115          1701 AND 1790 AND 0701 AND 1702  
01116          THEN MOVE '?????' TO MAJOR OF STUD-DB-REC  
01117              STRING ! * CANNOT DETERMINE MAJOR OF ! LAST-NAME OF  
01118                  SPIN-OFF-REC FRST-MDLE-NAME OF SPIN-OFF-REC SSN OF  
01119                      SPIN-OFF-REC  
01120                  * DATA NOT INCLUDED IN STATISTICS* DELIMITED BY SIZE  
01121                  INTO ERR-MSG-LINF  
01122          OPEN OUTPUT PRINT-FILE  
01123              WRITE PRINT-LINE FROM ERR-MSG-LINE AFTER POSITIONING  
01124                  3 LINES  
01125          CLOSE PRINT-FILE  
01126          MOVE SPACES TO ERR-MSG-LINE.  
01127      MOVE-GPA.  
01128          MOVE FTU-GPA OF FTU-SUMMARY OF SPIN-OFF-REC TO GPA OF  
01129              STUD-DB-REC.  
01130          WRITE-STUD-DB-REC.  
01131              IF SSN OF STUD-DB-REC IS NOT EQUAL TO 0  
01132                  THEN IF SSN OF STUD-DB-REC IS NUMERIC  
01133                      THEN WRITE STUD-DB-REC.  
01134                  PERFORM INITIALIZE-STUD-DB-REC.  
01135                  GO TO TRANSFER-DATA.  
01136          INITIALIZE-STUD-DB-REC.  
01137              MOVE SPACES TO STUD-DB-REC.  
01138              MOVE ZEROS TO GPA OF STUD-DB-REC.  
01139              MOVE ZEROS TO FTU-LAST-QTR OF STUD-DB-REC.  
01140              MOVE ZEROS TO ADVISOR-SSN OF STUD-DB-REC.  
01141              MOVE ZEROS TO SSN OF STUD-DB-REC.  
01142          END-OF-LOAD-STUD-DB.  
01143              CLOSE SPIN-OFF, STUD-DATA-BASE.  
01144          END-FTU-DATA-SECTION.
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01146      ***** REFERENCE HIPO 2.3 *****
01147      GENERATE-REPORTS SECTION.
01148      SORT SORT-WORK-SDR
01149          ASCENDING KEY SSN OF SORT-SDR-REC
01150          USING STUD-DATA-BASE
01151          GIVING STUD-DATA-RASE
01152          IF MATH-CHANGE-MADE = 'N' GO TO BRANCH-TO-PRINT-RTN.
01153          OPEN OUTPUT PRINT-FILE.
01154          OPEN INPUT MATH-DEPT-STUD-DB.
01155          OPEN I-O STUD-DATA-BASE.
01156          PERFORM MERGE-DATA.
01157          PERFORM READ-NEXT-STUD-DR-REC.
01158          PERFORM COMPARE-RECORDS THRU END-OF-MERGE-DATA.
01159          CLOSE PRINT-FILE.
01160          CLOSE MATH-DEPT-STUD-DB, STUD-DATA-BASE.
01161          BRANCH-TO-PRINT-RTN.
01162          PERFORM IDENTIFY-TYPE-REPORT THRU EXIT-ID-REPORT.
01163          GO TO EXIT-GEN-RPTS-SECTION.

01165      ***** REFERENCE HIPO 2.3.1 *****
01166      MERGE-DATA.
01167          READ MATH-DEPT-STUD-DB AT END WRITE STUD-DB-REC.
01168          GO TO END-OF-MERGE-DATA.
01169          READ-NEXT-STUD-DB-REC.
01170          READ STUD-DATA-BASE AT END GO TO END-OF-MERGE-DATA.
01171
01172      COMPARE-RECORDS.
01173          IF SSN OF STUD-DB-REC = SSN OF STUD-REC-M THEN
01174              MOVE CORR STUD-REC-M TO STUD-DB-REC
01175              WRITE STUD-DB-REC
01176              PERFORM NULL-STUD-DB-REC
01177              PERFORM READ-NEXT-STUD-DB-REC, PERFORM MERGE-DATA,
01178                  GO TO COMPARE-RECORDS.
01179          IF SSN OF STUD-REC-M < SSN OF STUD-DB-REC THEN
01180              STRING ' * SSN * SSN OF STUD-REC-M * NOT FOUND IN FTU '
01181              'SUPPLIED DATA. VERIFY SSN.' DELIMITED BY SIZE
01182              INTO ERR-MSG-LINE
01183              WRITE PRINT-LINE FROM ERR-MSG-LINE AFTER POSITIONING 3
01184                  LINES
01185              MOVE SPACES TO ERR-MSG-LINE
01186              PERFORM MERGE-DATA
01187              GO TO COMPARE-RECORDS.
01188              WRITE STUD-DB-REC.
01189              PERFORM READ-NEXT-STUD-DB-REC.
01190              GO TO COMPARE-RECORDS.
01191              END-OF-MERGE-DATA. EXIT.
01192              NULL-STUD-DB-REC.
01193              IF ADVISOR-NAME OF STUD-REC-M IS EQUAL TO SPACES
01194              THEN IF ADVISOR-SSN OF STUD-REC-M IS EQUAL TO ZEROS
01195              THEN IF ATTEND-DATA OF STUD-REC-M = SPACES
01196              THEN IF MBR-DATA OF STUD-REC-M = SPACES
01197              THEN MOVE ZEROS TO SSN OF STUD-REC-M.

01199      ***** REFERENCE HIPO 2.3 (CONT) *****
01200      IDENTIFY-TYPE-REPORT.

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01201      IF COOD = 'C' PERFORM PRINT-STAT THRU END-PRINT-STAT.
01202      IF COOD = 'R' OR 'F' THEN
01203          MOVE 102400 TO SORT-CORE-SIZE
01204          SORT SORT-WORK-SDR
01205              DESCENDING KEY FTU-LAST-QTR OF SORT-SDR-REC
01206              ASCENDING KEY MAJOR OF SORT-SDR-REC
01207              ASCENDING KEY GRAD-UG-PB OF SORT-SDR-REC
01208              ASCENDING KEY LAST-NAME OF SORT-SDR-REC
01209              ASCENDING KEY FRST-MDLE-NAME OF SORT-SDR-REC
01210              USING STUD-DATA-BASE
01211              GIVING STUD-DATA-BASE
01212          PERFORM PRINT-REPT THRU END-OF-PRINT-REPT.
01213          IF COOD = 'A' THEN
01214              MOVE 102400 TO SORT-CORE-SIZE
01215              SORT SORT-WORK-SDR
01216                  ASCENDING KEY ADVISOR-SSN OF SORT-SDR-REC
01217                  ASCENDING KEY LAST-NAME OF SORT-SDR-REC
01218                  ASCENDING KEY FRST-MDLE-NAME OF SORT-SDR-REC
01219                  USING STUD-DATA-BASE
01220                  GIVING STUD-DATA-BASE
01221          PERFORM PRINT-REPT THRU END-OF-PRINT-REPT.
01222          EXIT-ID-REPORT. EXIT.

01224      ##### REFERENCE HIPO 2.3.2 #####
01225      PRNT-STAT.
01226          OPEN OUTPUT PRINT-FILE.
01227          MOVE ZEROS TO ACCUMULATORS.
01228          MOVE ZEROS TO QTR-BUFF.
01229          WRITE PRINT-LINE FROM PAGE-HEAD-DEPT AFTER POSITIONING 0
01230          LINES.
01231          WRITE PRINT-LINE FROM STUD-STAT-HEAD AFTER POSITIONING
01232          2 LINES.
01233          WRITE PRINT-LINE FROM DATE-HEAD AFTER POSITIONING 2 LINES.
01234          OPEN INPUT STUD-DATA-BASE.
01235          COMPUTE-CURRENT-STAT.
01236          READ STUD-DATA-BASE AT END CLOSE STUD-DATA-BASE,
01237          GO TO CURRENT-QTR-TO-QTR-BUFF.
01238          IF FTU-LAST-QTR OF STUD-DR-REC IS NOT EQUAL TO
01239          CURRENT-QTR THEN GO TO COMPUTE-CURRENT-STAT.
01240          IF MAJOR OF STUD-DR-REC = 'COMP' THEN PERFORM COMP-TALLY.
01241          IF MAJOR OF STUD-DR-REC = 'MATH' THEN PERFORM MATH-TALLY.
01242          IF MAJOR OF STUD-DR-REC = 'STAT' THEN ADD 1 TO STAT-UG
01243          OF ACCUMULATORS.
01244          GO TO COMPUTE-CURRENT-STAT.
01245          COMPUTE-CURRENT-STAT.
01246          IF GRAD-UG-PB OF STUD-DR-REC = 'G' THEN
01247          ADD 1 TO COMP-GR OF ACCUMULATORS.
01248          IF GRAD-UG-PB OF STUD-DR-REC = 'U' THEN
01249          ADD 1 TO COMP-UG OF ACCUMULATORS.
01250          IF GRAD-UG-PB OF STUD-DR-REC = 'P' THEN
01251          ADD 1 TO COMP-PR OF ACCUMULATORS.
01252          MATH-TALLY.
01253          IF GRAD-UG-PB OF STUD-DR-REC = 'G' THEN
01254          ADD 1 TO MATH-GR OF ACCUMULATORS.
01255          IF GRAD-UG-PB OF STUD-DR-REC = 'U' THEN
01256          ADD 1 TO MATH-UG OF ACCUMULATORS.

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01257 IF GRAD-UG-PB OF STUD-DB-REC = 'P' THEN
 01258 ADD 1 TO MATH-PR OF ACCUMULATORS.
 01259 CURRENT-QTR-TO-QTR-RUFF.
 01260 MOVE CURRENT-QTR TO QTR-RUFF.
 01261 UPDATE-STAT-HIST-FILE.
 01262 OPEN I-O STAT-HIST-DR, OUTPUT HIST-REORG.
 01263 PERFORM READ-HIST THRU EXIT-READ-HIST.
 01264 CLOSE STAT-HIST-DR, HIST-REORG.
 01265 PERFORM SORT-STAT-HIST.
 01266 OPEN INPUT STAT-HIST-DB.
 01267 PRINT-STAT-LOOP.
 01268 READ STAT-HIST-DR AT END GO TO END-PRINT-STAT-LOOP.
 01269 MOVE ZEROS TO ACCUMULATORS.
 01270 MOVE CORR STAT-REC TO ACCUMULATORS.
 01271 ADD COMP-UG OF ACCUMULATORS COMP-GR OF ACCUMULATORS
 COMP-PB OF ACCUMULATORS GIVING COMPTOT OF ACCUMULATORS.
 01272 ADD MATH-UG OF ACCUMULATORS MATH-GR OF ACCUMULATORS
 MATH-PB OF ACCUMULATORS GIVING MATHTOT OF ACCUMULATORS.
 01273 MOVE STAT-UG OF ACCUMULATORS TO STATTOT OF ACCUMULATORS.
 01274 ADD COMPTOT OF ACCUMULATORS MATHTOT OF ACCUMULATORS
 STATTOT OF ACCUMULATORS GIVING TOTSTUDS OF ACCUMULATORS.
 01275 MOVE QTR OF STAT-HIST-DR TO QTR-PRINT.
 01276 WRITE PRINT-LINE FROM CURRENT-QTR-PRINT AFTER POSITIONING
 3 LINES.
 01277 WRITE PRINT-LINE FROM STUD-STAT-COL-HEAD AFTER POSITIONING
 2 LINES.
 01278 ADD MATH-UG OF ACCUMULATORS STAT-UG OF ACCUMULATORS COMP-UG
 OF ACCUMULATORS GIVING TOT-UG OF STUD-STAT-UNGRAD.
 01279 MOVE CORR ACCUMULATORS TO STUD-STAT-UNGRAD.
 01280 WRITE PRINT-LINE FROM STUD-STAT-UNGRAD AFTER POSITIONING
 2 LINES.
 01281 ADD MATH-GR OF ACCUMULATORS COMP-GR OF ACCUMULATORS GIVING
 TOT-GR OF STUD-STAT-GRAD.
 01282 MOVE CORR ACCUMULATORS TO STUD-STAT-GRAD.
 01283 WRITE PRINT-LINE FROM STUD-STAT-GRAD AFTER POSITIONING
 2 LINES.
 01284 ADD COMP-PB OF ACCUMULATORS MATH-PB OF ACCUMULATORS
 GIVING TOT-PB OF STUD-STAT-POST-BAC.
 01285 MOVE CORR ACCUMULATORS TO STUD-STAT-POST-BAC.
 01286 WRITE PRINT-LINE FROM STUD-STAT-POST-BAC AFTER
 POSITIONING 2 LINS.
 01287 MOVE CORR ACCUMULATORS TO STUD-STAT-TOT.
 01288 WRITE PRINT-LINE FROM STUD-STAT-TOT AFTER POSITIONING
 2 LINES.
 01289 MOVE SPACES TO PRINT-LINE.
 01290 WRITE PRINT-LINE AFTER POSITIONING 3 LINES.
 01291 GO TO PRINT-STAT-LOOP.
 01292 END-PRINT-STAT-LOOP.
 01293 MOVE SPACES TO PRINT-LINE.
 01294 WRITE PRINT-LINE AFTER POSITIONING 0 LINES.
 01295 CLOSE PRINT-FILE, STAT-HIST-DB.
 01296 END-PRINT-STAT. EXIT.

01310 ***** REFERENCE HIPO 2.3.3 *****
 01311 PRINT-REPT.
 01312 IF COOD = 'R' THEN MOVE 'R' TO KODE.

01313 IF COOD = 'F' THEN MOVE 'F' TO KODE.
01314 IF COOD = 'A' THEN MOVE 'A' TO KODE.
01315 PERFORM PRINT-RTN THRU PRINT-RTN-END.
01316 IF COOD = 'R' THEN
01317 MOVE 102400 TO SORT-CORE-SIZE
01318 SORT SORT-WORK-SDR
01319 DFSCENDING KEY ADVISOR-SSN OF SORT-SDR-REC
01320 ASCENDING KEY LAST-NAME OF SORT-SDR-REC
01321 ASCENDING KEY FRST-MDLE-NAME OF SORT-SDR-REC
01322 USING STUD-DATA-BASE
01323 GIVING STUD-DATA-BASE
01324 MOVE 'S' TO KODE
01325 PERFORM PRINT-RTN THRU PRINT-RTN-END.
01326 END-OF-PRINT-REPT. EXIT.
01327 EXIT-GEN-RPTS-SECTION. EXIT.

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01329      ***** REFERENCE HIPO 4.1 *****
01330      PRINT-RTN SECTION.
01331      MOVE 'NO' TO BREAK-STATUS.
01332      OPEN INPUT STUD-DATA-BASE OUTPUT PRINT-FILE.
01333      READ STUD-DATA-BASE
01334          AT END MOVE 'NO' INPUT FROM STUD DATA BASE TO
01335          PRINT-LINE, WRITE PRINT-LINE AFTER POSITIONING 2 LINES
01336          GO TO EXIT-PRINT-RTN-SECTION.
01337      LOOP-PRINT-RTN.
01338          PERFORM LOAD-BREAK-FIELDS.
01339          PERFORM PRINT-HEADINGS THRU EXIT-PRINT-HEADINGS.
01340          PERFORM PRINT-DATA THRU EXIT-PRINT-DATA UNTIL BREAK-STATUS
01341          IS NOT EQUAL TO 'NO'.
01342          IF BREAK-STATUS IS NOT EQUAL TO 'EOF' THEN
01343              MOVE 'NO' TO BREAK-STATUS
01344              GO TO LOOP-PRINT-RTN.
01345      PRINT-RTN-END.
01346          MOVE SPACES TO PRINT-LINE.
01347          WRITE PRINT-LINE AFTER POSITIONING 0 LINES.
01348          CLOSE STUD-DATA-BASE, PRINT-FILE.
01349      EXIT-PRINT-RTN-SECTION.
01350          GO TO END-OF-PRINT-RTN-SECTION.

01352      PRINT-HEADINGS.
01353          MOVE SPACES TO PRINT-LINE.
01354          WRITE PRINT-LINE FROM PAGE-HEAD-DEPT AFTER POSITIONING
01355          0 LINES.
01356          IF KODE = 'R' OR 'F' THEN
01357              PERFORM FORMULATE-SUB-HEADINGS THRU EXIT-SUB-HEAD.
01358          IF KODE = 'F'
01359              WRITE PRINT-LINE FROM FAC-ADV-HEAD AFTER POSITIONING
01360              2 LINES.
01361          IF KODE = 'R' OR 'F'
01362              WRITE PRINT-LINE FROM TITLE-ROST AFTER POSITIONING
01363              2 LINES.
01364          IF KODE = 'S' MOVE 'I' FACULTY ADVISOR EXTRACT OF STUDENT ROST
01365          PER 'I' TO TITLE-LINE
01366              WRITE PRINT-LINE FROM TITLE-ROST AFTER POSITIONING 2
01367              LINES.
01368          IF KODE = 'O' WRITE PRINT-LINE FROM FORMER-STUD-HEAD AFTER
01369          POSITIONING 2 LINES.
01370          WRITE PRINT-LINE FROM DATE-HEAD AFTER POSITIONING 2 LINES.
01371          MOVE SPACES TO PRINT-LINE, WRITE PRINT-LINE AFTER POSITIONING
01372          2 LINES.
01373          IF KODE = 'A'
01374              THEN IF ADVISOR-NAME OF STUD-DB-REC IS EQUAL TO SPACES
01375                  THEN WRITE PRINT-LINE FROM ADVISEE-HEAD-ALT AFTER
01376                  POSITIONING 2 LINES
01377                  ELSE MOVE ADVISOR-NAME OF STUD-DB-REC TO ADVISOR-NAME
01378                      OF ADVISEE-HEAD
01379                      WRITE PRINT-LINE FROM ADVISEE-HEAD AFTER POSITIONING
01380                      2 LINES.
01381          IF KODE = 'F' WRITE PRINT-LINE FROM FAC-ADV-COL-HEAD AFTER
01382          POSITIONING 2 LINES.
01383          EXIT-PRINT-HEADINGS. EXIT.
01384

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01385 LOAD-BREAK-FIELDS.
 01386 MOVE MAJOR OF STUD-DR-REC TO BREAK-1.
 01387 MOVE GRAD-UG-PR OF STUD-DR-REC TO BREAK-2.
 01388 MOVE ADVISOR-SSN OF STUD-DR-REC TO BREAK-3.

01389 FORMULATE-SUB-HEADINGS.
 01390 IF MAJOR OF STUD-DR-REC = 'COMP' THEN
 01391 IF GRAD-UG-PR OF STUD-DR-REC = 'G' THEN
 01392 MOVE ' GRADUATE COMPUTER SCIENCE MAJORS '
 01393 TO TITLE-LINE
 01394 ELSE IF GRAD-UG-PR OF STUD-DR-REC = 'U' THEN
 01395 MOVE ' UNDERGRADUATE COMPUTER SCIENCE MAJORS '
 01396 TO TITLE-LINE
 01397 ELSE MOVE ' POST-BACCALAUREATE COMPUTER SCIENCE MAJORS '
 01398 TO TITLE-LINE
 01399 ELSE NEXT SENTENCE.
 01400 IF MAJOR OF STUD-DR-REC = 'MATH' THEN
 01401 IF GRAD-UG-PR OF STUD-DR-REC = 'G' THEN
 01402 MOVE ' GRADUATE MATHEMATICAL SCIENCE MAJORS '
 01403 TO TITLE-LINE
 01404 ELSE IF GRAD-UG-PR OF STUD-DR-REC = 'U' THEN
 01405 MOVE ' UNDERGRADUATE MATHEMATICS MAJORS '
 01406 TO TITLE-LINE
 01407 ELSE MOVE
 01408 'POST-BACCALAUREATE MATHEMATICAL SCIENCE MAJORS'
 01409 TO TITLE-LINE
 01410 ELSE NEXT SENTENCE.
 01411 IF MAJOR OF STUD-DR-REC = 'STAT' THEN
 01412 MOVE ' UNDERGRADUATE STATISTICS MAJORS '
 01413 TO TITLE-LINE.
 01414 EXIT-SUB-HEAD. EXIT.

01415
 01416
 01417 PRTNT-DATA.
 01418 MOVE CORR STUD-DR-REC TO ABBR-NAME.
 01419 IF KODE = 'S'
 01420 THEN IF FTU-LAST-QTR OF STUD-DR-REC IS NOT EQUAL TO
 01421 CURRENT-QTR
 01422 THEN IF ADVISOR-SSN OF STUD-DR-REC IS EQUAL TO ZERO
 01423 THEN PERFORM CONTINUE-ON, GO TO PRINT-DATA.
 01424 IF KODE = 'S' THEN PERFORM ROSTER-PRINT.
 01425 IF KODE = 'R'
 01426 THEN IF FTU-LAST-QTR OF STUD-DR-REC
 01427 IS EQUAL TO CURRENT-QTR
 01428 THEN PERFORM ROSTER-PRINT.
 01429 IF KODE = 'O'
 01430 THEN IF FTU-LAST-QTR OF STUD-DR-REC IS NOT EQUAL TO
 01431 CURRENT-QTR
 01432 THEN IF ATTEND-DATA OF STUD-DR-REC IS EQUAL TO ''
 01433 THEN IF MBR-DATA OF STUD-DR-REC IS EQUAL TO ''
 01434 THEN IF ADVISOR-NAME OF STUD-DR-REC IS EQUAL TO ''
 01435 THEN IF ADVISOR-SSN OF STUD-DR-REC IS EQUAL TO 0
 01436 THEN GO TO CONTINUE-ON.
 01437 IF KODE = 'O' PERFORM ROSTER-PRINT.
 01438 IF KODE = 'F' AND FTU-LAST-QTR OF STUD-DR-REC IS =
 01439 CURRENT-QTR
 01440 MOVE ABBR-NAME TO NAME OF FAC-ADV-DET-LINE
 01441 MOVE ADVISOR-NAME OF STUD-DR-REC TO ADVISOR-NAME

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01442      OF FAC-ADV-DET-LINE
01443      WRITE PRINT-LINE FROM FAC-ADV-DET-LINE AFTER
01444      POSITIONING 2 LINES.
01445      IF KODE = 'A'
01446          THEN IF FTU-LAST-QTR OF STUD-DB-REC IS EQUAL TO
01447              CURRENT-QTR
01448          MOVE ABR-NR NAME TO NAME OF ADVISEE-DET-LINE
01449          WRITE PRINT-LINE FROM ADVISEE-DET-LINE AFTER POSITIONING
01450              2 LINES.
01451      CONTINUE-ON.
01452          READ STUD-DATA-BASE AT END MOVE 'EOF' TO BREAK-STATUS
01453          GO TO EXIT-PRINT-DATA.
01454      CONTINUE-ON-END.
01455      IF KODE = 'F'
01456          THEN IF FTU-LAST-QTR OF STUD-DB-REC IS NOT EQUAL TO
01457              CURRENT-QTR THEN MOVE 'EOF' TO BREAK-STATUS.
01458          GO TO EXIT-PRINT-DATA.
01459      IF KODE = 'R'
01460          THEN IF FTU-LAST-QTR OF STUD-DB-REC IS NOT EQUAL TO
01461              CURRENT-QTR
01462              THEN MOVE '0' TO KODE
01463                  MOVE 'YES' TO BREAK-STATUS
01464                  GO TO EXTT-PRINT-DATA.
01465      IF KODE = 'R' OR 'F'
01466          THEN IF MAJOR OF STUD-DB-REC
01467              IS NOT EQUAL TO BREAK-1 OR GRAD-US-PB OF STUD-DB-REC
01468              IS NOT EQUAL TO BREAK-2
01469              MOVE 'YES' TO BREAK-STATUS.
01470      IF KODE = 'A' OR 'S'
01471          THEN IF BREAK-3 IS NOT EQUAL TO ADVISOR-SSN
01472              OF STUD-DB-REC THEN MOVE 'YES' TO BREAK-STATUS.
01473      IF KODE = '0' MOVE 'NO' TO BREAK-STATUS.
01474      EXTT-PRINT-DATA. EXIT.

01475      ROSTER-PRINT.
01476          MOVE CORP STUD-DB-REC TO NAME-LINE.
01477          MOVE FTU-LAST-QTR OF STUD-DB-REC TO FTU-LAST-QTR-EDIT.
01478          MOVE LAST-YR-ATT-EDIT TO LAST-YR-ATT OF FTU-LAST-QTR
01479              OF NAME-LINE.
01480          IF LAST-QTR-ATT = '1' THEN
01481              MOVE 'F' TO LAST-QTR-ATT SUBTRACT 1 FROM LAST-YR-ATT-EDIT
01482              MOVE LAST-YR-ATT-EDIT TO LAST-YR-ATT.
01483          IF LAST-QTR-ATT = '2' THEN
01484              MOVE 'W' TO LAST-QTR-ATT.
01485          IF LAST-QTR-ATT = '3' THEN
01486              MOVE 'S' TO LAST-QTR-ATT.
01487          IF LAST-QTR-ATT = '4' THEN
01488              MOVE 'U' TO LAST-QTR-ATT.
01489          IF MARITAL-STATUS OF NAME-LINE = '1' THEN
01490              MOVE 'S' TO MARITAL-STATUS OF NAME-LINE.
01491          IF MARITAL-STATUS OF NAME-LINE = '2' THEN
01492              MOVE 'M' TO MARITAL-STATUS OF NAME-LINE.
01493          IF MARITAL-STATUS OF NAME-LINE = '3' THEN
01494              MOVE 'U' TO MARITAL-STATUS OF NAME-LINE.
01495          WRITE PRINT-LINE FROM NAME-LINE AFTER POSITIONING 2 LINES.
01496          MOVE CORP STUD-DB-REC TO ADDR-LINE.
01497          WRITE PRINT-LINE FROM ADDR-LINE AFTER POSITIONING 1 LINES.
01498

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01499 MOVE CORR STUD-DR-REC TO ADDR-PARENT-LINE.
01500 WRITE PRINT-LINE FROM ADDR-PARENT-LINE AFTER POSITIONING
01501 1 LINES.
01502 MOVE CORR STUD-DR-REC TO FTU-ATTN-LINE.
01503 WRITE PRINT-LINE FROM FTU-ATTN-LINE AFTER POSITIONING
01504 1 LINES.
01505 END-OF-PRINT-RIN-SECTION.

STATISTICS SOURCE RECORDS = 1505 DATA DIVISION STATEMENTS = 503 PROCEDURE
 OPTIONS IN EFFECT SIZE = 120832 BUF = 12496 LINECNT = 57 SPACE1, FLAG1, SEQ1,
 OPTIONS IN EFFECT NODMAP, NOPMAP, NOCLIST, SUPMAP, NOXREF, NOSXREF, LOAD, NODECK
 OPTIONS IN EFFECT NOTERM, NONUM, NOBATCH, NONAME, COMPILE=01, NOSTATE, NORESIDENT, N
 OPTIONS IN EFFECT OPTIMIZE, NOSYMDMP, NOTEST, NOVERH, ZWA, SYST, NOENDJOB
 ---CFRDC-HASP JOB STATISTICS---

TIMES -- 2.07 MINUTES ELAPSED 29.44 SECONDS CPU 8.32 SECONDS I/O \$16
 UR -- 1,512 CARDS READ 0 CARDS PUNCHED 1,580 LINES PRINTED
 TO/CORE -- 416 DISK EXCPS 0 TAPE EXCPS 120K REQUESTED

HASp SYSTEM LOG

\$ 20.42.19 JOB 174 -- COMP698P --15 C B
 N 20.44.23 JOB 174 END EXECUTION.

```
//COMP698P JOB (1770,3386,$$$$,FTU,45,30,20,,7),'ROGER SIFRIT', X JOB 174
// CLASS=B,MSGLEVEL=(1,1)
***JOBPARMSS=NO
// EXEC CORUC,PARM=FLAG1
XXCOR4C  PROC LIB1='USF.SS.COPYLIB',LIB2='SYS2.NPDSSRCE',      00000100
XX          UNIT=,UN2=,VL1=,VL2=                                00000200
*** ALIAS NAME -
*** DATE LAST MODIFIED - 12/23/75 - RSP                                00000300
XXCOR  EXEC PGM=IKFCRL00,PARM=NOLOAD                                     00000400
XXSTFPLIB DD DSN=SYS1.PPLTNK,DISP=SHR                                     00000500
//COR.SYSIN DD *
X/SYSIN   DD DSN=&SOURCE,DISP=(OLD,DELETE)                               00000600
XXSYSLIB DD DSN=&LIB1,DISP=SHR,UNIT=&UN1,VOL=&VL1                         00000700
XX          JCL - DSN=USF.SS.COPYLIB,DISP=SHR,UNIT=,VOL=                  00000800
XX          DSN=&LIB2,DISP=SHR,UNIT=&UN2,VOL=&VL2                         00000900
XX          JCL - DSN=SYS2.NPDSSRCE,DISP=SHR,UNIT=,VOL=                  00001000
XXSYSLIN  DD DSN=&LOADSET,DISP=(MOD,PASS)                                00001100
XX          UNIT=SYSDA,SPACE=(CYL,(1,1)),DCB=(RECFM=FB,BLKSIZE=800)        00001200
XXSYSPRINT DD SYSOUT=A                                                 00001300
XXSYSPUNCH DD DUMMY,SYSOUT=                                         00001400
XXSYSUT1   DD UNIT=SYSDA,SPACE=(CYL,(2,1))                                00001500
XXSYSUT2   DD UNIT=SYSDA,SPACE=(CYL,(2,1))                                00001600
XXSYSUT3   DD UNIT=SYSDA,SPACE=(CYL,(2,1))                                00001700
XXSYSUT4   DD UNIT=SYSDA,SPACE=(CYL,(2,1),RLSE),DISP=(MOD,PASS)           00001800
XXSYSUT5   DD UNIT=SYSDA,SPACE=(CYL,(2,1),RLSE),DISP=(MOD,PASS)           00001900
*** PROJ 0030 CFRDC SYSTEMS PROGRAMMING
// **** ALLOCATION FOR COMP698P.  (STEP 001) ****
STEPLIB    350   3330  DISK  SYSLINK  COR          (STEP 001) ****
SYSIN      403   2540  RDR   SYS1.PPLINK
SYSLIB     354   3330  DISK  USFPK2   SYS76155.T204220.RV151.COMP698P.R0000001
          150   3330  DISK  SYSIPL   USF.SS.COPYLIB
SYSLIN     351   3330  DISK  SYSWK2   SYS76155.T204220.RV151.COMP698P.LOADSET
SYSPRINT   430   1403  PRT   SYS76155.T204220.RV151.COMP698P.R0000002
SYSPUNCH   DUMMY          NULLFILE
SYSUT1     351   3330  DISK  SYSWK2   SYS76155.T204220.RV151.COMP698P.R0000003
SYSUT2     151   3330  DISK  SYSWK1   SYS76155.T204220.RV151.COMP698P.R0000004
SYSUT3     151   3330  DISK  SYSWK1   SYS76155.T204220.RV151.COMP698P.R0000005
SYSUT4     351   3330  DISK  SYSWK2   SYS76155.T204220.RV151.COMP698P.R0000006
SYSUT5     351   3330  DISK  SYSWK2   SYS76155.T204220.RV151.COMP698P.R0000007
```

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